


FACULTY OF ECONOMICS
AND BUSINESS ADMINISTRATION

ENABLING PERFORMANCE MEASUREMENT SYSTEMS AND MANAGERIAL BEHAVIOUR: THE UNDERLYING DRIVERS AND MECHANISMS

Evelyn Van der Hauwaert

Ghent University

Faculty of Economics and Business administration

Department of Accountancy and Corporate Finance

Sint-Pietersplein 7, 9000 Ghent/Belguim

Evelyn.VanderHauwaert@UGent.be

Supervisor: Prof. dr. Werner Bruggeman

Co-supervisor: Prof. dr. Patricia Everaert

Dissertation submitted to the Faculty of Economics and Business Administration, Ghent University, in fulfillment of the requirements for the degree of Doctor in Applied Economic Sciences

PhD Series – Ghent University, October 2014
Faculty of Economics and Business Administration

SUPERVISOR

Prof. dr. Werner Bruggeman

DOCTORAL JURY

Prof. dr. Marc De Clercq

(Ghent University, dean)

Prof. dr. Patrick Van Kenhove

(Ghent University, Academic Secretary)

Prof. dr. Patricia Everaert

(Ghent University, co-supervisor)

Prof. dr. Anja Van den Broeck

(KU Leuven)

Prof. dr. Henri Dekker

(VU University Amsterdam)

Prof. dr. Sally Widener

(Clemson University)

ACKNOWLEDGEMENTS

The completion of this doctoral journey would not have been possible without the help and the support of many people. I would like to take a moment to thank them.

First of all, I would like to thank my supervisors. Thank you Werner for offering me the opportunity to start this journey and to go abroad for several months. You enriched my thoughts with your reflections and you inspired me to be critical and think out of the box. Patricia, thanks for your generous support and knowledgeable advice. Thank you for the valuable meetings in which we tackled the data and literature and tried to find a way to make our story comprehensive and readable.

Additionally, I would like to thank Patrick Van Kenhove. Patrick thank you for being part of my doctoral guidance committee. When I had some problems concerning the research method you were there to give my advice. Your methodological comments improved my work substantially. Another member of my doctoral guidance committee I would like to thank is Maarten Vansteenkiste. Maarten, thank you for guiding me into the world of SDT, this theory has become a pivotal part of my dissertation. I also want to give a special word of thanks to Anja Van den Broeck. Anja, thank you joining us during the last months of this doctoral journey and being part of my exam committee. It was refreshing to receive your ideas and comments from a self-determination theory perspective.

I am also greatly indebted to the external members of my reading and exam committee, Henri Dekker and Sally Widener. Sally, thank you for being a devoted member of my exam committee, for reading my dissertation and giving constructive comments. Henri, I'm glad we met in Melbourne. I highly appreciated the time you devoted to earlier drafts of the second study of this dissertation. Many thanks, Henri and Sally, for the valuable feedback it enabled me to further improve the dissertation.

Furthermore, I want to thank Ignace for offering me the possibility to work at the department of Accountancy and Corporate Finance. This has given me many opportunities to learn. The department houses a pleasant atmosphere, in which I loved to work..

I am very grateful to Geert Scheipers and Valerie Decoene, who helped me gathering data for the first study. I appreciate the help you provided me to get in contact with organizations which

participated to the research. In addition, I would like to thank you for the interviews we had concerning the first study.
A word of thanks also goes to all managers for the interviews and for filling out the questionnaire. Without your help, this research could not have been done.

A special word of gratitude goes to my colleagues and former colleagues. Elke, Jolien, Annelien, Bénédicte, Xavier, Lander, Elke, Ine, Virginie, Lindsay, Sophie, Lies, Ilse, Veerle, Ineke, Ghyslaine, Nico, thank you for all the shared laughter and advice. A special word of thanks goes to my office mate Evelien. Evelien, thanks for bearing with me these last seven years. You were the best office mate someone can dream of. Thanks for helping me structure my ideas, reading through several texts, giving advice, ... I'm definitely going to miss you.

I'm profoundly grateful to all my friends for the many great moments. Thanks for offering many opportunities to forget about the dissertation issues. At Akabe and Kievit I could really enjoy myself, and I made friends who supported me ever since. Also the TEW reunions with our little crowd were moments to look forward to. Thanks everyone for the welcome distraction.

And last, but definitely not least I want to thank my family and family-in-law. Thank you for the constant support every step of the way. Moeke and vake thanks for all the opportunities offered and the believe you have put in me. Sylvia, we are hand in glove. Thank you for being there for me every step of the way! Linthe, thanks for just being mammies little girl. Harald, you are my tower of strength. I could not imagine getting to the finish line without you. Thank you for everything.

NEDERLANDSTALIGE SAMENVATTING (SUMMARY IN DUTCH)

Een aantal decennia geleden werden verschillende prestatiemeetsystemen (PMSs) ontwikkeld. In een mum van tijd integreerden vele ondernemingen zo een prestatiemeetsysteem. Aan de basis van deze snelle integratie liggen (1) de oneindige publicaties van succesverhalen, en (2) het geloof dat PMSs de winst van de organisaties kunnen verhogen. Desondanks de succesverhalen bleven mislukkingen niet uit. Blijkbaar ging men iets te kort door de bocht door te veronderstellen dat PMSs in gelijk welke situatie lucratief zouden zijn voor de ondernemingen. Om aan de wispelturige uitkomst van PMSs tegemoet te komen en de effectiviteit van PMSs te verbeteren, werd het concept 'enabling' geïntroduceerd. Enabling betekent letterlijk 'in staat stellen'. Een enabling PMS houdt in dat werknemers door het PMS in staat worden gesteld om onvermijdelijke onvoorziene gebeurtenissen, die zich in hun werksituatie voordoen, aan te pakken. Als de organisatie er in slaagt een PMS te ontwikkelen dat enabling is, dan zou het toch het verwachte effect kunnen hebben en kunnen leiden tot een stijging van de winst.

Het potentieel van een enabling PMS, gecombineerd met het gebrek aan onderzoek over dit concept, leidt tot de focus van de *eerste studie* in dit doctoraat. Een gevallenstudie in twee Belgische bedrijven heeft het mogelijk gemaakt om de condities onder dewelke een PMS als enabling aanzien wordt te onderzoeken. Deze studie wees uit dat de variabelen die voorgaand onderzoek reeds aanhaalde om een PMS enabling te maken, ontoereikend zijn. Onze studie vond bewijs dat de perceptie van managers over het al dan niet enabling zijn van het PMS ook afhangt van de manier waarop de managers mogen participeren aan het ontwikkelingsproces van het PMS. Enkel als de managers 'echte' participatie in plaats van pseudo participatie ervaren, zullen zij het PMS als enabling ervaren.

Nadat de eerste studie aangaf hoe een PMS als enabling kan ervaren worden, onderzochten we het concept van een enabling PMS. De *tweede studie* moet duidelijkheid bieden op de vraag of de prestaties van de managers worden beïnvloed door een enabling PMS en hoe deze relatie precies is opgebouwd. Om een onderzoeksmodel op de bouwen, steunt deze studie op de psychologische zelf-determinatie theorie. Deze motivatietheorie is in de jaren '70 ontwikkeld en stelt dat motivatie is opgebouwd uit verschillende types van motivatie. Deze theorie benadrukt het belang van het opsplitsen van motivatie in deze verschillende subcategorieën. Indien deze opsplitsing niet gebeurt, dan stellen ze dat mogelijke relaties niet zullen gevonden worden en dat onduidelijke verbanden en tegenstrijdige uitkomsten zullen blijven bestaan. Bij het onderzoeken van werkmotivatie is het onderscheid tussen autonome en gecontroleerde motivatie van uitermate groot belang. Wanneer

iemand gecontroleerd gemotiveerd is voor het werk, dan zal die persoon die taken in zijn job vervullen om niet ontslaan te worden, om op het einde van het jaar de bonus binnen te halen, om zich niet te moeten schamen ten opzichte van vrienden, collega's en familie. Wanneer iemand autonoom gemotiveerd is voor de job, dan zal die persoon werken omdat het werk leuk is of omdat die persoon begrijpt dat het voor de onderneming belangrijk is dat de verschillende taken in het takenpakket tot een goed einde worden gebracht. Aan de hand van de zelf-determinatie theorie is het mogelijk om de relatie tussen enabling PMS en prestaties van de managers, te verklaren. Het vooropgestelde model werd via de techniek van 'structural equation modeling' getest. Om de nodige data te verzamelen werd een vragenlijst uitgestuurd. 186 managers uit verschillende Belgische bedrijven stuurden een volledig ingevulde vragenlijst terug. Op basis van deze data konden we onze onderzoeksvraag aanpakken. De resultaten van deze studie wijzen uit dat een enabling PMS wel degelijk een belangrijk effect heeft op de prestaties van de managers. Dit effect is echter indirect en verloopt via de autonome motivatie. Een enabling PMS heeft dus een positieve relatie met autonome motivatie en autonome motivatie heeft op zijn beurt een positieve relatie met de prestaties van de managers. De bevindingen van de studie illustreren ook dat de gecontroleerde motivatie geen significante verklaringskracht heeft in de PMS-prestatie relatie.

Een enabling PMS is dus in staat om de prestaties van de managers positief te beïnvloeden, echter het zijn beloningen die aanzien worden als het grootste en effectiefste wapen om de motivatie van werknemers te beïnvloeden. Daarom wordt in de *derde studie* van dit doctoraat onderzocht of beloningen een positief effect hebben op autonome motivatie in een omgeving waar een PMS gebruikt wordt. Om deze onderzoeksvraag te behandelen, wordt gebruik gemaakt van data vergaard door het uitsturen van vragenlijsten. In totaal vulden 314 managers de vragenlijst in. De resultaten tonen aan dat ondernemingen baat hebben bij een PMS dat aanzien wordt als enabling. Managers die hun PMS als hoog enabling ervaren hebben immers een hogere autonome motivatie dan managers die hun PMS als laag enabling ervaren of dan managers die geen PMS hebben. Hieruit blijkt nogmaals het belang van het hebben van een PMS en meer in het bijzonder het hebben van een hoog enabling PMS. De bevindingen van de studie geven ook aan dat als de manager al een hoog enabling PMS heeft, dat dan het hebben van een bonus en meer specifiek het hebben van een eerlijke bonus van ondergeschikt belang is. Echter wanneer de manager zijn PMS beschouwt als laag enabling, dan merken we dat hoe hoger de eerlijkheid van de bonus, hoe hoger de autonome motivatie van de manager blijkt te zijn.

EXECUTIVE SUMMARY

A few decades ago, several performance measurement systems (PMSs) were developed. These systems have been rapidly adopted by many organizations. The reason for this fast integration was the publication of numerous success stories and a strong belief in the power of these systems to increase organizational profit. Although many success stories were revealed, failures were bound to follow. To improve the effectiveness of the PMSs the concept of enabling formalization has been introduced. An enabling formalization can contribute to the effectiveness of a PMS as it seeks to put employees in a position to deal with the inevitable contingencies in their work.

The potential of an enabling PMS, combined with the lack of research on this concept, results in the focus of the *first study* in this dissertation. A case study research in two Belgian companies made it possible to investigate the conditions under which a PMS is perceived as enabling. This study revealed that the variables detected in previous research to create an enabling PMS are insufficient. More specifically, middle managers' perception of the PMS as an enabling technology is also contingent on the mode of participation and their experienced participation congruence during the development process. Only when managers have true participation they will perceive the PMS as enabling.

After having discovered the possibility of a PMS to be an enabling technology, the *second study* investigated whether and how managerial performance is affected by PMSs designed as an enabling technology. To build a research model, the study drew on the self-determination theory and described the motivational mechanisms that play a pivotal role in the relationship between a PMS and managerial performance. Structural equation modeling on questionnaire data obtained from 186 managers from different Belgian companies were used to get an indication on the research question. The results indicated the significance of an enabling PMS. An enabling PMS impacted performance indirectly, and this effect occurred through autonomous motivation. Our findings also demonstrated that controlled motivation had no significant explanatory power in the PMS-performance relationship.

An enabling PMS can enhance managerial performance, however it are rewards that are seen as the organization's most important motivational arsenal. Therefore, the *third study* in this dissertation investigated whether individual monetary rewards can have an effect on autonomous motivation when the organization uses an enabling PMS. This study, which made use of questionnaire data of

314 managers, revealed that organizations benefit from PMSs that are perceived to be highly enabling. The higher the degree of the enabling PMS, the less effective a fair individual monetary bonus was to enhance the level of autonomous motivation. In organizations where the PMS was perceived to be minimally enabling, the results indicated that the higher the level of perceived fairness of the individual monetary reward, the higher the level of autonomous motivation.

TABLE OF CONTENTS

CHAPTER 4 – THE EFFECT OF MONETARY REWARDS ON AUTONOMOUS MOTIVATION IN AN ENABLING PERFORMANCE MEASUREMENT SYSTEM CONTEXT

CHAPTER 5 – CONCLUSIONS

LIST OF TABLES

CHAPTER 2 – THE BALANCED SCORECARD AS AN ENABLING TECHNOLOGY: THE ROLE OF PARTICIPATION

CHAPTER 3 – THE EFFECT OF ENABLING PERFORMANCE MEASUREMENT SYSTEMS ON AUTONOMOUS MOTIVATION, CONTROLLED MOTIVATION AND MANAGERIAL PERFORMANCE

CHAPTER 4 – THE EFFECT OF MONETARY REWARDS ON AUTONOMOUS MOTIVATION IN AN ENABLING PERFORMANCE MEASUREMENT SYSTEM CONTEXT

LIST OF FIGURES

CHAPTER 1 - GENERAL INTRODUCTION

1. BACKGROUND

A few decades ago, several performance measurement systems (PMSs) were developed. These systems have been rapidly adopted by many organizations. The reason for this fast integration is the publication of many success stories and the strong belief in the power of the PMS to increase organizational profit. Through the combination of financial and non-financial measures in these PMSs, organizations can better adapt to their strategy and compete in a dynamic environment. Although many success stories were revealed, failures were bound to follow. Consequently, research toward the effective development and use of a PMS boomed (e.g.; Bourne, Mills, Wilcox, Neely, & Platts, 2000; Bourne, Neely, Platts, & Mills, 2002; Kennerley & Neely, 2002; Neely, 2005; Neely, Gregory, & Platts, 2005; Neely et al., 2000). Nevertheless, the absence of a clear and comprehensive typology for analyzing more processual uses of management accounting systems makes investigation of their effectiveness difficult (Ahrens & Chapman, 2004). Therefore, the concept of enabling formalization has been introduced.

The concept of enabling found its origin in a study by Adler and Borys (1996). Those authors defined the concept of enabling in a workflow formalization context. An enabling formalization is one that helps committed employees to do their jobs more effectively and reinforce their commitment (Adler & Borys, 1996). This typology can be extended beyond workflow formalization (Adler & Borys, 1996). In 2004, Ahrens and Chapman translated the concept to a management control system context. These authors stated that an enabling use can contribute to the effectiveness as it seeks to put employees in a position to deal directly with the inevitable contingencies in their work. In addition, the role of an enabling typology to investigate the effectiveness of management control systems is stressed (Ahrens & Chapman, 2004).

The potential of an enabling PMS, combined with the lack of research on this concept, lead to the first focus of this dissertation. To meet this deficiency, this research addressed two research paths. First, case study research investigated the conditions under which a PMS is perceived as enabling. Second, the concept enabling formalization was conceptualized and operationalized. The latter delivers the opportunity for future research to compare their findings on enabling PMSs.

That PMSs have the power to affect managerial behavior has been known for decades (e.g.; Kaplan & Norton, 1992) and was the second focus of this dissertation. Scholars revealed that the real power of the PMS is the possibility to control the actions of the middle managers to attain the companies goals and consequently realize the organization's strategy (Wouters & Roijmans, 2011). In this view, the importance of the PMS to be enabling has been stressed (Wouters & Wilderom, 2008). Nevertheless, there has been little research on the effectiveness of PMSs on the attitudes of middle managers. Consequently, the second focus of this dissertation investigated the effect of enabling PMSs on middle managers' motivation and performance. This research answered to the call for research on the effect of performance measurement systems on performance (Bourne, Melnyk, & Faull, 2007; Bourne, Melnyk, Bititci, Platts, & Andersen, 2014).

The relationship between an enabling PMS and managerial performance was scrutinized. However, when investigating managerial performance, it is inevitable to integrate rewards into the analyses. Rewards are considered pivotal in an organization's motivational arsenal (Rynes, Gerhart, & Parks, 2005). It is impossible to imagine a work environment without rewards. The importance of rewards leads to a tremendous amount of literature on rewards. Nevertheless, after decades of research the results are still ambiguous (Franco-Santos, Lucianetti, & Bourne, 2012). Studies indicating the positive effects of rewards (e.g.; Fang & Gerhart, 2012; Kunz & Pfaff, 2002; Rynes et al., 2005) are as numerous as research revealing negative effects of rewards (e.g.; Falk & Kosfeld, 2006; Kohn, 1993; Sliwka, 2007; Stone, Bryant, & Wier, 2010). The ambiguous findings can be caused by the investigation of partial settings (Ferreira & Otley, 2009). Consequently, part of the equivocal results can be addressed by integrating information on the presence of a PMS and the degree to which the PMS is perceived as enabling. The second study of this dissertation tried to solve the second part of the problem and investigated the effect of an enabling PMS on performance. Rewards were integrated in the third study of this dissertation. In this part, a profound look into the differences in outcome when comparing managers in an organization without PMS and managers in organizations using a PMS was integrated.

2. DISSERTATION STRUCTURE

As previously noted, this dissertation comprised three interrelated studies. Each study tried to elucidate one or two of the research questions and the methods used in each of the studies are described below.

Study 1 *– The balanced scorecard as an enabling technology: the role of participation.*

The aim of this study was to gain insights into the conditions necessary to create an enabling PMS. Previous research indicated the preference for enabling formalization, as this has frequently been correlated with positive outcomes (e.g.; Adler & Borys, 1996; Parker, 2003). The effectiveness of an enabling PMS has already been suggested (Sundin, Granlund, & Brown, 2010; Wouters, 2009; Wouters & Roijmans, 2011; Wouters & Wilderom, 2008). Nevertheless, it remains rather unclear whether a PMS can be an enabling technology in every situation. Therefore, this study investigated the conditions under which a PMS will be enabling. To enable a search toward underlying mechanisms and drivers, this study conducted case study research on companies that developed and use a balanced scorecard, which is an example of a PMS. The focus on a typical example of a PMS makes it possible to rule out findings due to differences within a PMS.

Study 2 *– The effect of an enabling performance measurement system on autonomous motivation, controlled motivation, and managerial performance.*

The first study examined the possibility of a PMS being an enabling technology. As that study discovered that a PMS can be perceived as enabling when there has been true participation during its development, the second study investigated whether and how PMSs designed as an enabling technology affect managerial performance. To build a research model, the study drew on self-determination theory and described the motivational mechanisms that play a pivotal role in the relationship between a PMS and managerial performance. Path modeling was used to get an indication on the research question. As the research on enabling management control systems has mainly been performed through case study and longitudinal research (Ahrens & Chapman, 2004; Cools, Emmanuel, & Jorissen, 2008; Free, 2007; Sundin et al., 2010; Wouters, 2009; Wouters & Roijmans, 2011; Wouters & Wilderom, 2008), this study engaged in the development of a scale to measure the degree to which a PMS is perceived as an enabling technology. This scale was used to test the hypothesized relationships.

Study 3 *– The effect of an enabling performance measurement system on autonomous motivation: the pivotal role of individual monetary rewards.*

The roots for the third study were found in the second study. The second study revealed that an enabling PMS enhances autonomous motivation, and subsequently managerial performance. The question one should ask is "What is the additional power of rewards?". Rewards are considered pivotal in an organization's motivational arsenal (Rynes et al., 2005). However, further research on the effect of monetary rewards in combination with PMSs is recommended (Franco-Santos et al., 2012). Therefore, the aim of the third study was to investigate whether rewards can have an effect on managerial outcomes, and more specifically autonomous motivation, when the organization has an enabling PMS.

The remainder of this dissertation is structured as follows. Chapter 2 contains the first study that investigated the conditions under which the PMS will be perceived as an enabling technology. Chapter 3 presents the second study that indicated the effect an enabling PMS has on autonomous motivation, controlled motivation and managerial performance. Chapter 4 details the third study that determined whether individual monetary rewards are useful in situations where a PMS has already been introduced. Finally, chapter 5 elaborates on the main findings, limitations, opportunities for future research and the academic and practical contributions of this dissertation.

3. REFERENCES

Adler, P. S., & Borys, B. (1996). Two types of bureaucracy: Enabling and coercive. *Administrative Science Quarterly*, 41(1), 61-89.

Ahrens, T., & Chapman, C. S. (2004). Accounting for flexibility and efficiency: A field study of management control systems in a restaurant chain. *Contemporary Accounting Research*, 21(2), 271-301.

Bourne, M., Melnyk, S., & Faull, N. (2007). The impact of performance measurement on performance. *International Journal of Operations & Production Management*, 27(8), 781-783.

Bourne, M., Melnyk, S. A., Bititci, U., Platts, K., & Andersen, B. (2014). Emerging issues in performance measurement. *Management accounting research*, 25(2), 117-118.

Bourne, M., Mills, J., Wilcox, M., Neely, A., & Platts, K. (2000). Designing, implementing and updating performance measurement systems. *International Journal of Operations & Production Management*, 20(7), 754-771.

Bourne, M., Neely, A., Platts, K., & Mills, J. (2002). The success and failure of performance measurement initiatives - Perceptions of participating managers. *International Journal of Operations & Production Management*, 22(11), 1288-1310.

Cools, M., Emmanuel, C., & Jorissen, A. (2008). Management control in the transfer pricing tax compliant multinational enterprise. *Accounting, Organizations and Society*, 33(6), 603-628.

Falk, A., & Kosfeld, M. (2006). The hidden costs of Control. *The American Economic Review*, 96(5), 1611-1630.

Fang, M., & Gerhart, B. (2012). Does pay for performance diminish intrinsic interest? *The International Journal of Human Resource Management*, 23(6), 1176-1196.

Ferreira, A., & Otley, D. (2009). The design and use of performance management systems: An extended framework for analysis. *Management accounting research*, 20(4), 263-282.

Franco-Santos, M., Lucianetti, L., & Bourne, M. (2012). Contemporary performance measurement systems: A review of their consequences and a framework for research. *Management accounting research*, 23(2), 79-119.

Free, C. (2007). Supply-chain accounting practices in the UK retail sector: Enabling or coercing collaboration? *Contemporary Accounting Research*, 24(3), 897-933.

Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard - Measures that drive performance. *Harvard Business Review*, 70(1), 71-79.

Kennerley, M., & Neely, A. (2002). A framework of the factors affecting the evolution of performance measurement systems. *International Journal of Operations & Production Management*, 22(11), 1222-1245.

Kohn, A. (1993). Why Incentive Plans Cannot Work. *Harvard Business Review*, 71(5), 54-63.

Kunz, A. H., & Pfaff, D. (2002). Agency theory, performance evaluation, and the hypothetical construct of intrinsic motivation. *Accounting Organizations and Society*, 27(3), 275-295.

Neely, A. (2005). The evolution of performance measurement research - Developments in the last decade and a research agenda for the next. *International Journal of Operations & Production Management*, 25(12), 1264-1277.

Neely, A., Gregory, M., & Platts, K. (2005). Performance measurement system design - A literature review and research agenda. *International Journal of Operations & Production Management*, 25(12), 1228-1263.

Neely, A., Mills, J., Platts, K., Richards, H., Gregory, M., Bourne, M., & Kennerley, M. (2000). Performance measurement system design: developing and testing a process-based

approach. *International Journal of Operations & Production Management*, 20(10), 1119-1145.

Parker, S. K. (2003). Longitudinal effects of lean production on employee outcomes and the mediating role of work characteristics. *Journal of Applied Psychology*, 88(4), 620-634.

Rynes, S. L., Gerhart, B., & Parks, L. (2005). Personnel psychology: performance evaluation and pay for performance. *Annual Review of Psychology*, 56(571-600.

Sliwka, D. (2007). Trust as a signal of a social norm and the hidden costs of incentive schemes. *The American Economic Review*, 97(3), 999-1012.

Stone, D. N., Bryant, S. M., & Wier, B. (2010). Why are financial incentive effects unreliable? An extension of Self-Determination theory. *Behavioral Research in Accounting*, 22(2), 105-132.

Sundin, H., Granlund, M., & Brown, D. A. (2010). Balancing multiple competing objectives with a balanced scorecard. *European Accounting Review*, 19(2), 203-246.

Wouters, M. (2009). A developmental approach to performance measures - Results from a longitudinal case study. *European Management Journal*, 27(1), 64-78.

Wouters, M., & Roijmans, D. (2011). Using prototypes to induce experimentation and knowledge integration in the development of enabling accounting information. *Contemporary Accounting Research*, 28(2), 708-736.

Wouters, M., & Wilderom, C. (2008). Developing performance-measurement systems as enabling formalization: A longitudinal field study of a logistics department. *Accounting, Organizations and Society*, 33(4-5), 488-516.

CHAPTER 2 - THE BALANCED SCORECARD AS AN ENABLING TECHNOLOGY: THE ROLE OF PARTICIPATION*

ABSTRACT

This study explores the conditions under which the balanced scorecard (BSC) is perceived as an enabling technology. Drawing on the literature on enabling formalization and the development of performance measurement systems we posit that the balanced scorecard can be designed as an enabling technology characterized by repair, internal transparency, global transparency, and flexibility. However, based on field interviews in two Belgian companies, we find that middle managers' perception of the balanced scorecard as enabling is contingent on *the way middle managers participate* during the BSC development process. We find that middle managers perceive the balanced scorecard as enabling only when given sufficient opportunity for *true participation* during the development process. Hence, developing a balanced scorecard as an enabling technology is more than just a matter of having the necessary features that enhance the enabling nature of a BSC.

Keywords: balanced scorecard; performance measurement systems; participation; enabling formalization; case study

* Van der Hauwaert Evelyn and Bruggeman Werner, 2013, International Journal of Management Accounting Research, Vol.3 (2)

1. INTRODUCTION

Previous literature has revealed that the effectiveness of a performance measurement system (PMS) depends on the way the system is developed and used. In an attempt to identify the important process variables affecting PMS effectiveness, recent studies have used the concept of enabling formalization as a theoretical underpinning (Sundin, Granlund, & Brown, 2010; Wouters, 2009; Wouters & Sportel, 2005; Wouters & Wilderom, 2008). The concept of enabling (and coercive) formalization has been developed by Adler and Borys (1996). These authors used the terms enabling and coercive formalization to describe work processes. In addition to the context of work processes, these terms can be transmitted into many domains (Adler & Borys, 1996).

In the management accounting context, Ahrens and Chapman (2004) suggested using the framework of *enabling and coercive formalization* when evaluating the effectiveness of management control systems. Most research interest has been devoted to *enabling* formalization. The preference for enabling formalization ensued from positive research results (e.g., Adler & Borys, 1996; Parker, 2003). Consequently, scholars have applied enabling formalization to gain insights into issues related to management control systems (e.g., Ahrens & Chapman, 2004). The conducted studies covered several subdomains, such as transfer pricing (Cools, Emmanuel, & Jorissen, 2008), budget systems (Chapman & Kihn, 2009; Hartmann & Maas, 2011), self-managed work teams (Proenca, 2010), supply chain management (Free, 2007), and PMS (Sundin et al., 2010; Wouters, 2009; Wouters & Roijmans, 2011; Wouters & Wilderom, 2008). Research on enabling formalization in a PMS context, delivered interesting insights in the use of a PMS (Ahrens & Chapman, 2004; Sundin et al., 2010), the use of multiple objectives in the PMS design (Sundin et al., 2010), the development of a PMS (Wouters, 2009; Wouters & Wilderom, 2008), and knowledge integration (Wouters & Roijmans, 2011). As a result, previous research has already identified the necessary characteristics to make a PMS enabling (Ahrens & Chapman, 2004) and to stimulate its enabling nature during the development process (Wouters & Wilderom, 2008). In addition, the literature has indicated that an enabling formalization can contribute to the motivation and performance of managers (Adler & Borys, 1996; Wouters & Roijmans, 2011; Wouters & Wilderom, 2008). Although interesting insights have been obtained, Wouters (2009) calls to perform research on the conditions under which a developmental PMS approach is most feasible and effective.

The aim of this paper is to investigate *the conditions* under which a PMS is *perceived as an enabling technology.* The paper extends the previous literature on the development of a PMS and adds to previous research, complementing the characteristics of PMS development (Wouters, 2009; Wouters

& Wilderom, 2008). To achieve this aim an exploratory case study of two Belgian companies, in which a balanced scorecard (BSC) has been introduced, has been conducted. Both companies implemented the BSC using the same developmental process. In one company the BSC has been perceived as an enabling technology by most of the middle managers. In the other organization, only a limited number of middle managers perceived the BSC as an enabling technology. To reveal the conditions determining the effectiveness of the BSC development process, insights from interviews with 19 middle managers in the two firms are used. The results suggest that participation plays a pivotal role in the perception of the BSC as an enabling technology. Only if the middle manager perceives true participation (in contrast to pseudo-participation) the BSC will be perceived as an enabling technology.

The present study contributes to the research about an enabling PMS in two ways. The findings of this study provide a partial clarification of the different outcomes of the perception of the BSC as an enabling technology. Moreover, the findings suggest other possible drivers that need to be taken into consideration when investigating the pivotal conditions under which a BSC will be perceived as an enabling technology.

The remainder of this paper is organized as follows. First, the conceptual framework of this study is outlined. Second, the exploratory case study is described. Third, the results of the case study are presented and discussed. Fourth, the implications of the results, limitations of the case study, and directions for future research are discussed.

2. CONCEPTUAL FRAMEWORK

Adler and Borys (1996) distinguished two different types of formalization that could determine work processes: enabling and coercive formalization. Work processes formalized in a coercive manner make the employees feel forced to perform certain tasks. In contrast, an enabling formalization attempts to provide information to make it possible for employees to deal with tasks more effectively (Adler & Borys, 1996).

Formalization can help firms channel their focus and adapt more effectively to their environment (Patel, 2011). Nevertheless, previous research has indicated that not all types of formalization have the same effect on performance or other outcome variables. The types of formalization that are perceived as beneficial are those that enable employees to master their tasks (Hempel, Zhang, & Han, 2012). The literature indicates that an enabling formalization can positively affect employees'

outcomes (Parker 2003). For example, Adler and Borys (1996) found that an enabling formalization can positively affect motivation. Enabling formalization has also been found to make employees feel supported and motivated by the rules and systems in place (Wouters & Wilderom, 2008). A higher degree of motivation will lead to higher effort, performance, and well-being (e.g., Baard, Deci, & Ryan, 2004; Gagné & Forester, 2008; Miserandino, 1996). In comparison with coercive formalization, enabling formalization empowers employees to better perform their tasks (Wouters & Wilderom, 2008). Consequently, the enabling formalization is promising for improving personnel and organizational performance. As a result, scholars may have to redirect their attention from coercive toward enabling types of formalization (Vlaar, Van den Bosch, & Volberda, 2006).

The enabling type of formalization has received much attention as scholars believe in its potential. Previous literature has indicated possibilities to expand the enabling formalization concept to a wider domain than work processes (Adler & Borys, 1996; Ahrens & Chapman, 2004) and to use the concept of enabling formalization to explain accounting-context-related findings. Consequently, the concept that had originally been developed to manage work processes got translated to give indication on management accounting related topics.

Research on budgets (Chapman & Kihn, 2009; Hartmann & Maas, 2011), teamwork (González-Romá, Fortes Ferreira, & Peiró, 2009), transfer pricing (Cools et al., 2008), supply chain practices (Free, 2007), and performance measurement systems (Ahrens & Chapman, 2004; Wouters & Wilderom, 2008) using the enabling framework has been executed. When translating the concept of enabling formalization to a management control system context, Ahrens and Chapman (2004) used the original four features of the Adler and Borys' framework. We follow their line of reasoning to further translate the concept to a more specific type of PMS, namely the BSC.

When looking closely at the concept of enabling formalization and its translation toward management accounting system concepts and, more specifically, the BSC, it should be noted that Adler and Borys (1996) state that four general features relate to enabling formalization: internal transparency, repair, flexibility, and global transparency. When developing enabling formalization, Adler and Borys (1996) took work processes to explain the concepts. When work processes exhibit these four features, the work processes are enabling (Adler & Borys, 1996). According to the definition of Adler and Borys (1996), *internal transparency* in an enabling formalization means that users need both an understanding of the logic of the equipment's internal functioning and information on the equipment's status. In an enabling formalization, *repair* generates procedures that facilitate responses to real work contingencies. Breakdowns and repairs identify problems with formal procedures, which become opportunities for improvement. *Flexibility* holds that machines are

programmed to give advice and make suggestions, but it is the responsibility of the user to make controlling decisions after the system displays the requisite data. Finally, *global transparency* refers to technologies that are programmed to provide operators with extensive information relating to the status of the broader production process.

Following the previous line of research, it would be beneficial to develop a BSC that is perceived as an enabling technology. To reach this goal, the BSC must be developed in such a way that it will contribute to the four features of an enabling formalization. Consequently, it is important to discuss how the four features of an enabling technology could be addressed in a BSC context.

First, to fulfil the *internal transparency* feature, an understanding of the logistics of local processes is required (Ahrens & Chapman, 2004). The implementation of the BSC should accompany management from the early design stages of development, using and refining the strategy of the organization (De Geuser, Mooray, & Oyon, 2009). The BSC, as described by Kaplan and Norton (1992), is characterized by its four perspectives and a strategy link. As a result, managers can be given a clear view of the system, allowing them to understand the internal functioning of the BSC. Moreover, they gain insight into the performance indicators of the BSC as they have been developed from the different perspectives. The strategy map visualizes the processes of linking the different perspectives and performance indicators (Kaplan & Norton, 2000), which can contribute to the feature of internal transparency.

Second, *repair* suggests that processes and shortcomings can be addressed. Users of the system are provided with the capabilities to fix problems (Ahrens & Chapman, 2004). Kaplan and Norton (2000) state that strategy maps, which are an essential part of the BSC approach (Speckbacher, Bischof, & Pfeiffer, 2003), make it possible to detect major gaps in strategy and empower executives to take early corrective actions. In addition, the BSC can enable companies to modify strategies when necessary (Kaplan & Norton, 1996).

Third, *flexibility* refers to the degree to which people have autonomy in the system (Ahrens & Chapman, 2004). The managers should be actively involved in the process for the effective development and application of the BSC (e.g., Decoene & Bruggeman, 2006). Kaplan and Norton (1996) state that the development of a BSC is an iterative process in which each step delivers incremental improvement. In addition, the BSC provides a framework that allows changes over time.

Fourth, *global transparency* provides insight into the structure of the organization and indicates how the local processes fit into the organization as a whole (Adler & Borys, 1996; Ahrens & Chapman, 2004). The BSC can help employees understand strategy (Kaplan & Norton, 2000) and comprehend how business units, departments and processes are aligned with the organization as a whole (Kaplan & Norton, 1996); it can also be used to manage interdependencies (Lillis, 2002) and to help

communicate objectives to the people who need to perform the work (Kaplan & Norton, 1996; Speckbacher et al., 2003). As a consequence, the BSC gives a clear view on how employees' tasks fit into the whole.

This overview of how the BSC can include the four features (necessary to create an enabling technology), provides guidance for the developmental phase. The way in which the system has been developed is of major importance (Otley, 1999). Scholars have investigated the triggers to determine a good developmental process of PMSs (e.g., Bourne, Mills, Wilcox, Neely, & Platts, 2000; Bourne, Neely, Platts, & Mills, 2002; Kennerley & Neely, 2002, 2003). Previous research on the PMS as an enabling technology has focused on determinants influencing the development process (Wouters, 2009; Wouters & Roijmans, 2011; Wouters & Wilderom, 2008). These studies have delivered insights into the variables driving the developmental process. In particular, a process in which managers can *experiment* with the performance measures is needed to enhance the enabling nature of a PMS (Wouters & Wilderom, 2008). The development process also needs to be *based on experience* and *professionalism* to contribute to the enabling nature of the PMS (Wouters & Wilderom, 2008). Although much is known regarding this developmental process, there is still a need for future research on the conditions under which a developmental PMS approach is effective (Wouters, 2009). Future research should clarify the antecedents and consequences of this developmental approach for the PMSs (Wouters & Wilderom, 2008). Therefore, this paper will investigate:

Research question: "Under which conditions is a BSC perceived as an enabling technology?"

3. METHODOLOGY

3.1 CASE STUDY RESEARCH

To address the research question, this study draws from two cases in Belgian companies, which developed and used the BSC for several years. The focus on conditions that determine the perception on the enabling character of the BSC justifies *case study research* for four reasons. First, case study research has a comparative advantage over the survey method when the topic of inquiry has an *exploratory* nature. Previous research shows that not all factors have been found (e.g., Wouters, 2009; Wouters & Wilderom, 2008). Case study research provides a unique approach for studying PMSs in a real-life context, discovering factors not expected, based on previous research. Second, in case study research, researchers can take advantage of flexible data collection if *unexpected outcomes* prove to be interesting (Eisenhardt, 1989). By conducting semi-structured interviews, additional insights can be obtained. Third, field-based insights offer the opportunity to further

investigate conflicting or ambiguous findings (Lillis & Mundy, 2005). Previous studies on the BSC indicated that undiscovered factors may confound the outcome of the perception on a PMS as an enabling technology (e.g., Wouters, 2009; Wouters & Wilderom, 2008). Finally, studying the *perceptions* of the BSC as an enabling PMS, could benefit from direct and in-depth contact with middle managers, who experienced the development of a BSC.

In contrast to these advantages, one of the largest challenges case study research must overcome is its sensitivity to concerns regarding methodological rigor in terms of validity and reliability (Gibbert, Ruigrok, & Wicki, 2008). However, actions were taken to overcome these concerns.

3.2 Case Study Design

To address the research question, we investigated companies that developed a company-wide BSC following the same development process. This will enable us to detect driving antecedents that influence the effectiveness of a BSC. Based on a business contact, we were introduced to a consulting firm having several years of experience with the development and implementation of the BSC at medium sized and large companies. To increase external validity, we preferred to use several cases for this research (Gibbert & Ruigrok, 2010). Therefore the consulting company introduced us to three organizations having -what they considered- successful BSC implementations. The consulting firm guided the implementation in all three companies following the same developmental approach. Two of the three companies were willing to participate in the research. The third company was not interested in participating as they were planning to restructure their organization in the short-term.

The two remaining companies are eligible for this case study for three reasons. First, the development of the BSC occurred in both companies more than a year before we were introduced. As a result, in both companies the *development phase was finished*.

Second, *the purpose* for the introduction of the BSC in both companies was similar. Both companies wanted to become more strategy oriented and wanted to motivate managers and employees to increase performance. With strategy maps, all tasks at each business level were aligned to the strategy.

Third, as indicated above, both cases hired the same consulting company to guide them through the development of the BSC. As a result, both case companies have undergone the *same development process*. The process is split up into different phases. The first phase concerned the corporate level and contained multiple workshops. The first workshop was related to strategy. A core team of top-level managers received training on the concepts of a strategy-focused organization. During subsequent workshops, the managers were involved in an intensive dialogue about the challenges in

the market environment, formulated the mission and the vision of the division, described the strategy using strategy maps, translated the strategy map into a BSC, defined performance targets, and planned strategic improvement initiatives. In a second phase, the development process as implemented on the corporate level was repeated at the level of each business unit. The core team of each business unit defined its mission, vision, and strategy map in accordance with the corporate strategy map; linked its key performance indicators to the business unit strategy map, set targets and defined improvement actions.

In addition to the development process, the companies' organizational characteristics are an important facet of the case. Therefore, next sub-section will provide information on the organizational characteristics of the two companies.

3.3. Case Company Details

The first organization in this case is a Belgian industrial company listed on Euronext Brussels. The company is internationally active with divisions in three different continents. The organization employs approximately 8,000 employees worldwide. However, we only investigate the local Belgian manufacturing division of the company, where the BSC was implemented by the consulting company. Hence, the Belgian manufacturing division is the subject of this case-based research. As a result, it is more important to discuss the characteristics of this division than the figures for the firm worldwide. In the Belgian manufacturing division (hereafter case A), 2,000 employees are employed. Case A can be seen as a profit center with its own annual report, and is located at five different chemical factories spread over the Flemish-speaking part of the country. Case A is active in the B2B and B2C market. In Table 1, the profit over turnover ratio has been calculated as a measure for financial performance. This ratio is shown for four consecutive years, i.e., the year of the BSC development and the three following years. The results of the calculation reveal large fluctuations. The interviews were conducted during the second year after introducing the BSC. A first revision of the performance measurement system had been planned a few months after the interviews took place.

The second case (hereafter case B) is a Belgian semi-government organization. The company employs nearly 700 people, who are spread across two sites located in the Flemish-speaking part of Belgium. The organization is a manufacturing company active in water supply. This organization operates in the B2B and B2C market. The annual report of the company offers the opportunity to calculate profit over turnover, which yields information on organization's financial performance (Table 1). The ratios indicate that the organization's financials did not fluctuate much. In this organization, the BSC was

designed and implemented approximately six years before the interviews took place (in 2004 - 2005). Two years after the introduction of the BSC, the company began privatization (in 2007). The privatization led to a decrease in the profit over turnover ratio. The ratio before the privatization was 12.45% in 2004, 8.18% in 2005, 10.30% in 2006; however dropped to 4.08% in 2007 due to a significant fall in profit. In 2008 the ratio further decreased to 2.97%. The recovery started in 2009 (4.97%) and continued in 2010 (7.15%). Furthermore, four years after the introduction of the BSC (in 2009), the organization extended its activities. In addition to supplying potable water, the company started to organize the removal of dirty water from them as well. This emerging activity led to the implementation of a new business unit. For this business unit, the organization immediately repeated the BSC development process to create a BSC for this new business unit.

"Insert Table 1"

3.4. Data Collection

Interviews and archival data were collected over a period of 20 months. Through triangulation of different sources of data, possible deviations of construct validity were countered (Gibbert & Ruigrok, 2010). Within the interview data, three different types of interviews were conducted: interviews with middle managers at the two case companies, interviews with a top manager involved in the decision to implement the BSC in the company, and interviews with two consultants from the consulting firm, who guided the development of the BSC in both companies. All interviews were conducted in Dutch in March 2009, May 2009, and February 2010 (Figure 1). The interviews with middle managers at both companies were preceded by an interview with a person at a higher level in the organization who was involved in the decision to implement the BSC. These people provided more information on the structure and culture of the organization and recent events.

"Insert Figure 1"

The archival data include internal documents and website information. We were allowed to see slides of the presentations the consulting firm gave in the organizations, providing a clear view of the implementation process. In addition, the managers of case B shared their agenda related to the BSC with us. As a result, we gain better insight into how the process was conducted and which topics were the focus of the different meetings. In both firms, we were allowed to view the resulting BSC and the strategy map that had been developed during the different workshops. Table 2 summarizes the data.

"Insert Table 2"

During semi-structured in-depth interviews, the following open questions were posed:

- Can you describe the BSC of your department /company?
- What was the greatest difficulty you encountered during the development of the BSC?
- How do you experience the BSC in your department /company?
- What are the BSC's most valuable characteristics?

These open questions were followed by more profound questions probing about the four enabling characteristics (internal transparency, repair, flexibility, and global transparency). For example to learn more about the repair possibilities of the BSC, the following question was posed: "If something goes wrong in your department, does the BSC offer some possibilities to react to that?" If so, "How does this happen?".

The interviews took 45 to 114 minutes. We interviewed 19 middle managers, eight of whom were employed by case A and 11 of whom were employed by case B. More details on these interviews are shown in Table 3. As proposed by Eisenhardt (1989), we stopped interviewing within each of the two companies when theoretical saturation was reached. Most interviews were recorded and subsequently transcribed in Dutch to improve reliability. Where recording was not possible, extensive notes were taken during the interview; shortly after the interview, more detailed notes were written down (in Dutch). We thereby created a transparent database, allowing future researchers to replicate the research.

"Insert Table 3"

In addition to the interviews in the two companies, we conducted four interviews with two employees of the consulting organization (consultant 1 and consultant 2). The first and second interviews were conducted with consultant 1 approximately one month before the company interviews began (Figure 1). The first interview concerned phases in the development process and the background of the companies. These interviews provided deeper insight into the structure and culture of the organizations and the design and implementation phases of the BSC. These interviews added value because they delivered reliable information on the organization that is less to be biased toward socially desirable answers, than the information delivered by the interview with the top manager. The third interview (with consultant1) and fourth interview (with consultant 2) were conducted after completing the interviews in both companies. During this interview, additional

information was gathered about the development process. The focus was on how top management implemented various different steps within the organization, rather than the steps themselves.

3.5. Data Analysis

The data were analyzed systematically to avoid researcher bias and to create an audit trial using different data analysis steps. Because this study is highly exploratory and searches the conditions under which a BSC is perceived as enabling, one of the authors mined the data to set up a coding protocol. A combination of two approaches was used: a literature review and the use of the interview data to identify interesting paths. To this end, the data were transferred to NVivo 8. All interviews were coded using the coding protocol defined in the previous step. In the next step, the transcribed interviews were coded again. This coding was performed in a step separate from both the development of the coding protocol and the first coding of the data. Afterwards, matrices were used to systematically organize the data to identify emerging patterns. In a last step, these patterns were checked by comparing the data findings for case A and case B to determine whether a pattern was simply coincidental or appeared systematically in both cases, with several interviews in each case.

4. Findings and Discussion

4.1. Development of the BSC as an Enabling Technology

In the literature review, it became clear that the BSC will be an enabling technology when the four features of enabling formalization are fulfilled. The BSC must be internally transparent, offer repair possibilities, be flexible, and be globally transparent. To fulfill these features the execution of the development process is of utmost importance. Previous research indicated that the *development process* should be experienced-based, allow experimentation, and build on employees' professionalism (Wouters & Wilderom, 2008). In both companies, the development process was set up to contain those conditions to enhance the enabling nature of the BSC. Managers were invited to cooperate during workshops to choose the best strategy and key performance indicators for their department. Hence, the companies integrated the *experience* of their managers in the process. Consequently, in both companies, the development of the BSC was based on the experience of managers and employees of the organization. The workshops during the development process made it possible to *experiment* with the performance measures the managers wanted to integrate in the BSC. Consequently, experimentation was allowed during the development process. The workshops

were organized by a consulting firm, which provided a clear view of the development process[1], and allowed managers to be involved in the process. As a result, managers could make departmental efforts. This opportunity to make departmental efforts can stimulate professionalism (Wouters & Wilderom, 2008). The aforementioned characteristics allow the enabling nature of the BSC to be augmented (Wouters & Wilderom, 2008).

4.2 Perception on the BSC as an Enabling Technology

The variables needed to enhance the enabling nature of the BSC (experimentation, experience-based and professionalism) are present in both cases. Nevertheless, middle managers of only one of the companies perceived the BSC as an enabling technology. Only these managers reported that the four features (internal transparency, repair, flexibility, and global transparency) are present. In other words, despite the integration of the pivotal variables to support the enabling nature of the BSC in the development process, the managers of case B perceived the BSC as an enabling technology. In case A, most managers did not perceive their BSC as being flexible, containing repair possibilities, and being internally and globally transparent. The citations below demonstrate the differences in the perception on the feature "flexibility".

> "Some situations ask for experience. People with experience could resolve the problem, but the BSC does not make this possible. The problem with the BSC is its lack of adaptability to the changing environment." (Interviewee 7, facility manager, case A)

> "Flexibility when using the BSC is high. When we notice some critical success factors that do not measure what they should, we have the opportunity to refine or delete them." (Interviewee 10, head support services department, case B)

The citations show that the middle manager of case B views the BSC as flexible, whereas the middle manager of case A sees the BSC as not flexible. Similarly, differences in perception on the presence of the features internal transparency, global transparency and repair, were noticed. In Table 4, we elaborate on this finding by providing more quotes from middle managers expressing their perceptions of the features and whether the BSC fulfills them. The middle managers in case A almost always perceived the features as not fulfilled. In contrast, the middle managers of case B mostly held a positive view on the presence of the four features in their BSC.

[1] We had insight into the documents that were used to explain the concept strategy-focused organization and the timeline of the whole implementation process.

"Insert Table 4"

To obtain better insight into the degree to which the BSC did or did not exhibit the features of an enabling PMS, we considered all statements regarding the various features. When all statements or all but one statement indicated no fulfillment of the features, this was indicated in Table 5 with "- -". When all statements or all but one statement indicated fulfillment of the feature, "+ +" was marked in the table. When two or more than two statements showed a more nuanced view on the presence (absence) of a feature, but the majority of the statements are positive (negative), a "+" ("-") was used. Hence, Table 5 indicates that the managers of case A had a negative view of their BSC as enabling. All but two statements indicated middle managers in case A did not believe that their BSC was internally nor globally transparent and indicated that the BSC offered them no repair opportunities. Some of the managers, however, believed that the BSC was flexible. Nevertheless, the majority did not perceive the flexibility necessary for a BSC to be an enabling technology. In case B, all managers perceived their BSC as being globally transparent. The opinions of the managers toward the other features are more nuanced. Most of the managers believe the features are fulfilled. Nevertheless, some managers believe internal transparency, the repair possibilities, and the flexibility of the system could be optimized.

"Insert Table 5"

4.3. Perception on the BSC: Mode of Participation

In case A two out of eight interviewees perceived the BSC as enabling, while in case B nine out of 11 interviewees perceived the BSC as an enabling technology. From the internal documents of the consultancy firm and the internal documents of the two cases, we learned that the development process and the reason for implementing the BSC were similar in both cases. The format of the resulting BSC was also structured in the same way. Although the cases had a similar developmental approach, six out of the eight managers of case A did not perceive the BSC as an enabling technology. Moreover the presence of experimentation, experience-based, and professionalism during the development phase is not sufficient to create an enabling BSC. Therefore, a deeper analysis into the interviews and the internal documents is necessary to obtain a clear view on the conditions that ameliorate the enabling nature of the BSC during the development process. When discussing the developmental phase during the interviews, we noticed differences concerning *participation*.

Prior literature stated that *participation* in the development of a performance measurement system leads to better outcomes, such as increased satisfaction and performance (Kleingeld, Van Tuijl, & Algera, 2004). However, participation does not have a consistent effect on performance (Latham, Winters, & Locke, 1994). The degree to which participation is applied influences the performance of the manager (Hunton & Price, 1997). A high degree of participation is necessary to create positive outcomes. For instance, when employees can participate through involvement by advice or involvement by doing, augmentation of self-efficacy beliefs can occur (Forbes, 2005; Hunton & Price, 1994; Judge, 2007). In both cases managers participated in the development process. Four quotes on this topic can be found below. The first two quotes are from managers in case A. The third and the fourth quote are from managers in case B.

> "After two or three sessions, you have finally created a BSC, which is then proposed to the management. The things top management don't like are removed from the scorecard, and some things we 'forgot' are added. In this way, you are not the dominant coalition; you are the dominated coalition." (Interviewee 2, production manager, case A)

> "The results (from the workshop) did not surprise me. However, afterwards, top management put some things forward that did not match with what we proposed. This raises some questions because we only proposed minor changes, with small influence on the strategy." (Interviewee 8, order-to-cash manager, case A)

> "I was able to contribute to the development of the BSC during the workshops. I helped to create key performance indicators, which made it possible to measure pivotal facets to move the organization toward a better execution of the strategy." (Interviewee 12, head of support services department, case B)

> "My name was raised when it was decided who would participate in the process. However, I did not experience it as an obligation. I wanted to do it. … I have been able to be actively involved, and they also listened to what I had to say." (Interviewee 16, distribution manager, case B)

Although middle managers in both companies were invited to participate in the development process (by advice and by doing), there was no positive effect of participation in case A. In addition, other factors than the degree of participation should be considered. From the statements, it is clear

that the managers in case A (quotes 1 and 2 above) could not participate profoundly during the development of the BSC, in contrast to the managers in case B (quotes 3 and 4 above). Quotes from the other managers in both cases point in the same direction (see Table 6). In addition to the interviews, the firms' documents also give the impression of differences in the mode of participation. For example, we obtained a copy of the BSC of case A from top management. In this chart, all strategy maps for all business units were incorporated. The business unit strategy maps were under the corporate strategy map. All information was put on one big sheet of paper. In contrast, in case B, most interviewees brought an image of their specific strategy map. They provided explanations of how and why certain key performance indicators were integrated. In addition, a few managers told us about how they could use Microsoft Excel to implement and withdraw measures.

In our search for an explanation, we found the concepts of true and pseudo-participation. *True participation* is defined as being able to be spontaneous and free in discussions and being able to decide whether to accept or reject new things as a group (Argyris, 1953). The citations show that within case B, middle managers experienced true participation. In this case eight managers were invited to participate from the beginning of the project. All eight managers had the perception of true participation. Based on the interviews with the middle managers in case A, we can conclude that middle managers in case A perceived the whole process as forced. Argyris (1953) found similar findings within a budgeting context and called this forced process "pseudo-participation". His research indicated that top management sometimes wants subordinates to participate and therefore invites them to meetings to discuss the budget. However, top management does not appreciate subordinates who give their opinion. There is no room for employees to be spontaneous and free in the discussion. They do not really have the opportunity to decide as a group, despite being invited to meetings to discuss and determine the budget. There is no true participation for these employees. They are left with *pseudo-participation*. This experience was detected in case A. Seven middle managers could participate from an early stage to the development process; nevertheless five out of seven indicated they encountered pseudo-participation.

Interestingly, two of the managers in case A (interviewee 4 and interviewee 6, both production managers) did perceive the BSC as an enabling technology. When searching for an explanation, we noticed these managers indicated that they experienced true participation. These managers explained that top management kept their proposed key performance indicators in the BSC.

> "We were already using performance measures. During the (development) discussion, we were able to show that these measures were important for the

> organization. The other performance measures that they (top management) found important - only one or two – we have also included in the BSC." (Interviewee 6, production manager, case A)

The production manager cited above felt that top management was listening to him, as they only wanted to add two additional measures in the BSC. As a result, he perceived true participation. The other managers in case A stated that the key performance indicators they found important for their business and for incorporation in the BSC were omitted (Table 6). Subsequently, they were left with a feeling of pseudo-participation. This strengthens our finding that true participation is a pivotal driver for a developmental approach leading to the perception of a BSC as an enabling technology.

As a side remark, we could add that this finding stresses the importance of existing measures when introducing a BSC. Previous research already stated the importance of existing measures when introducing a PMS (Wouters & Sportel, 2005). The fact that the managers were able to propose existing measures to be included in the new developed BSC allowed true participation and consequently recognition of the BSC as an enabling technology.

In conclusion, middle managers must have true participation to recognize the BSC as an enabling technology. Nevertheless, this does not explain why two managers in case B did not perceive the BSC as an enabling technology, while both managers indicated they experienced true participation. To obtain a better indication of the underlying influential factors, we examined the interview transcriptions of these managers in great detail and compared them to the interviews with the other managers of case B. Interviewee 13 (order-to-cash manager case B) stated that the BSC was not flexible. This manager indicated that it is difficult to make all of the necessary changes to the BSC. She states there are opportunities to make changes, nevertheless it seems impossible to make the required changes. This manager told us she needed some things in the BSC that could not be implemented. As result, she was left with the feeling that integrating certain pivotal performance measures in the BSC is unattainable. Another manager in that company who attended the same meetings (interviewee 12, head of support services department) had a very positive view of the feature flexibility. Both managers worked within the support services business unit, but they worked in different departments. Moreover, interviewee 13 works in a department that is planning to change dramatically, by offering services in a totally new business area. Interviewee 13 indicated it was impossible to integrate and follow the changing conditions of their department using the BSC. It appears that in businesses that are rapidly changing, true participation is not sufficient to create a BSC that is perceived enabling.

To confirm this line of reasoning, we looked at the statements made by interviewee 11 (production manager, case B) on the features of the BSC. We found that interviewee 11 did not believe in repair opportunities, as the BSC did not offer a good overview of the business unit. However, the manager believed this would improve in the future. He indicated that the business unit had only existed for two years[2] and that when the BSC was developed, it was difficult to implement the optimal measures. Initially, the BSC felt like a bunch of red tape rather than a work instrument. Currently, the newly developed performance measures give some indication of how their business unit is doing. Nevertheless, the manager believes it will take some additional years to finalize the process and identify the appropriate measures that need to be integrated in the BSC to control their business unit. This finding suggests that managers of start-up and rapidly changing departments (business units) do not perceive the BSC as an enabling technology, despite they perceived true participation throughout the development process. Contrary, mature businesses seem to be more robust and capable of developing a BSC as an enabling technology.

Notably, we also noticed the importance of *participation congruence*. Some interviewees did not get the opportunity to participate in the process from the beginning (Table 6). This might influence their view on participation and the BSC as an enabling technology. Therefore, we asked these managers for further details. In response to the question of whether an interviewee found it frustrating that he was not asked to participate in the development process from the beginning, he answered:

> "No, I did not find it frustrating because if they had asked me to participate, I would not have wanted to, because I was a non-believer at the time. So, there was no need for me to participate then." (Interviewee 17, facility manager, case B)

Another manager indicated that she had not been involved in the introduction phase of the BSC. She explained it was not a part of her job. In response to asking whether she perceived it as a problem, she answered:

> "No, when it was interesting for me to participate, they (top management) openly asked who wanted to participate." (Interviewee 14, purchase manager, case B)

[2] This production manager works in the business unit that is occupied with the removal of dirty water.

Based on these responses, we notice that the middle managers' desired and actual level of participation are aligned. Middle managers who were not involved in the development process also indicated that they did not mind not being asked to participate. In addition, all managers that did participate in the development process mentioned being pleased that they were involved in the project despite experiencing pseudo-participation. Within the accounting information system research, Hunton and Price (1994) found that actual and desired participation need to be at the same level for participation to be meaningful. People should not participate against their will, and people willing to participate should not be left out. When actual participation exceeds desired participation, a feeling of saturation arises that negatively influences the effectiveness of participation. In this study, it seems that managers that had not been able to participate in the beginning of the development process perceived a balance between the level of actual and desired participation. As a result, this had no influence on the perception of participation. If the manager experiences participation congruence, the moment of getting involved in the development process will not influence his/her perception of true or pseudo-participation.

5. CONCLUSION

The objective of this study was to investigate under which conditions the BSC is perceived as an enabling technology. Based on field interviews in two Belgian companies we find that middle managers' perception of the BSC as an enabling technology is contingent on *the mode of participation* and their experienced *participation congruence* during the development process. *Maturity of the business (unit)* is detected as a moderating factor between true participation and perception of the BSC.

In our search for the conditions determining the differences in perceptions of the BSC as an enabling technology, the case data indicate that the mode of participation is an important determining condition. The BSC is only perceived as an enabling technology when middle managers experience *true participation*. True participation means that middle managers are offered the opportunity to provide input during the development of the BSC. Moreover, they have the ability to reject or accept new measures for the BSC, in agreement with the other middle managers. Contrary, middle managers do not perceive the BSC as an enabling technology when top management allows only *pseudo-participation*. In case of pseudo-participation, middle managers are asked their opinion on the development of the BSC, but they ultimately feel that their opinion is of no interest to top management and their suggestions are not taken into consideration.

In both cases, all managers find it important that their levels of actual and desired participation are in line with one another, so that they experience a sufficient level of *participation congruence.* If the manager experiences participation congruence, the moment of getting involved in the development process will not influence his/her perception of true or pseudo-participation.

A variable that can moderate the effect of true participation on the perception of the BSC as an enabling technology is the *maturity of the business*. Our study discovered that, true participation during the development process did not lead to a BSC being perceived as an enabling technology when the business was newly developed or was rapidly changing. For instance, one manager did not believe in the repair opportunities, as the BSC did not offer a good overview of the business. Another manager experienced the BSC as not flexible, because she found it difficult to make the necessary changes to the BSC.

The results of this study have practical implications. As enabling systems have a positive outcome on managerial and firm performances (e.g., Adler & Borys, 1996; Ahrens & Chapman, 2004; Wouters & Wilderom, 2008), firms should strive to create and apply the BSC as an enabling technology. However, not every developmental approach leads to a BSC that is perceived as enabling, i.e., including the four necessary features of repair, internal transparency, global transparency, and flexibility. To ensure that managers perceive the BSC as an enabling technology, organizations and management accountants should pay attention to the way in which middle managers can *participate* during the BSC development process. During the development process, top management should allow for true participation. Pseudo-participation is an impediment and should be avoided.

Next to practical implications, this research also contributes to the literature. Previous studies have indicated that an enabling formalization could lead to positive managerial performance outcomes (Adler & Borys, 1996; Parker, 2003), making enabling formalization an important topic for further research. In addition, scholars stated that the concept of enabling formalization can be translated to a management accounting system context (Ahrens & Chapman, 2004) and, more specifically, to PMSs (e.g., Wouters & Wilderom, 2008). Nevertheless, a PMS is not necessarily perceived as enabling. A developmental approach with specific characteristics is needed to create an enabling PMS (Wouters & Wilderom, 2008). This study indicates that a development approach may lead to an enabling BSC only when *true* participation is created in a *mature* business (unit) in which managers perceive participation *congruence.*

Our study has a number of limitations, which should be considered. First, the number of middle managers in this study is limited, and they are drawn from two companies; consequently, the findings are subject to sample size and firm selection bias. However, a large number of cases is not required for a productive contribution (Ahrens & Dent, 1998). Furthermore, case study research offers opportunities for in-depth observation and analysis in a way that permits contextual generalizability (Granlund, 2001; Lukka & Kasanen, 1995).

Second, we selected two companies that had followed a similar developmental approach. The BSC implementation process used in both companies aimed to design a BSC with the four enabling features, but led to different perception outcomes. This research design offered an excellent opportunity to compare two cases that followed a similar development process and identify the factors causing the differences in perception outcomes. Although the BSC development processes of the two companies were similar, we must be aware of the fact that differences in *company size, type of business, and level of financial performance* could potentially influence the observed enabling perceptions. However, during our case study interviews, there was no evidence indicating a direct effect of any of these organizational factors on the managers' enabling perception of the BSC.

Finally, we are aware that the period since the development of the BSC differs between the two companies and there is a potential risk that the *time frame* since adoption may affect managers' enabling perceptions. As proposed in previous research (Phua, Abernethy, & Lillis, 2011), we used the interview structure as an efficient approach to solve this potential problem. During the interview process, we only invited the interviewees to reflect on their enabling experience immediately after the BSC development process, as the aim was not to study the evolution of the enabling perception over time. We found it more important to select two companies that followed the same development process (same consulting firm with the same consultants, same approach with workshops sessions, top management involvement) to control for differences in development approach.

Related to our findings, we also suggest four directions for future research. First, further research could use a *large survey or experiment* to empirically test the proposed relationship between the mode of participation and the enabling perception of the BSC. Second, further studies might incorporate the *time* after the introduction of the BSC as a variable of interest. Similarly, a longitudinal study might be interesting to investigate the evolution of enabling perceptions by middle managers. Research that measures middle managers' perceptions at different points in time also might be helpful in detecting other underlying mechanisms. Third, future research could examine whether the impact of the type of participation during the BSC development on the enabling perception is contingent on the *manager's level* in the organization. Managers at different

hierarchical levels of the organization might be affected differently and might use PMSs for different reasons. Finally, it would be interesting to investigate the antecedents of *true and pseudo-participation*. Previous research indicated that firm characteristics can play a pivotal role in a PMS related context (e.g., HassabElnaby, Said, & Wier, 2005; Said, HassabElnaby, & Wier, 2003). For example, organizational characteristics could determine why one of the companies had true participation and the other organization was mainly characterized by pseudo-participation. The concept of true and pseudo-participation definitely needs further research in management accounting.

6. ACKNOWLEDGEMENTS

We would like to thank the two anonymous reviewers, Patricia Everaert, Anne Lillis, and participants at the seminar of The University of Melbourne and University of New South Wales in Sydney for their helpful comments.

7. REFERENCES

Adler, P. S., & Borys, B. (1996). Two types of bureaucracy: Enabling and coercive. *Administrative Science Quarterly*, 41(1), 61-89.

Ahrens, T., & Chapman, C. S. (2004). Accounting for flexibility and efficiency: A field study of management control systems in a restaurant chain. *Contemporary Accounting Research*, 21(2), 271-301.

Ahrens, T., & Dent, J., F. (1998). Accouting and organizations: Realizing the richness of field research. *Journal of Management Accounting Research*, 10(1-40.

Argyris, C. (1953). Human problems with budgets. *Harvard Business Review*, 31(1), 97-110.

Baard, P. P., Deci, E. L., & Ryan, R. M. (2004). Intrinsic need satisfaction: A motivational basis of performance and well-being in two work settings. *Journal of Applied Social Psychology*, 34(10), 2045-2068.

Bourne, M., Mills, J., Wilcox, M., Neely, A., & Platts, K. (2000). Designing, implementing and updating performance measurement systems. *International Journal of Operations & Production Management*, 20(7), 754-771.

Bourne, M., Neely, A., Platts, K., & Mills, J. (2002). The success and failure of performance measurement initiatives - Perceptions of participating managers. *International Journal of Operations & Production Management*, 22(11), 1288-1310.

Chapman, C. S., & Kihn, L. A. (2009). Information system integration, enabling control and performance. *Accounting, Organizations and Society*, 34(2), 151-169.

Cools, M., Emmanuel, C., & Jorissen, A. (2008). Management control in the transfer pricing tax compliant multinational enterprise. *Accounting, Organizations and Society*, 33(6), 603-628.

De Geuser, F., Mooray, S., & Oyon, D. (2009). Does the balanced scorecard add value? Empirical evidence on its effect on performance. *European Accounting Review*, 18(1), 93-122.

Decoene, V., & Bruggeman, W. (2006). Strategic alignment and middle-level managers' motivation in a balanced scorecard setting. *International Journal of Operations & Production Management*, 26(3-4), 429-448.

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review*, 14(4), 532-550.

Forbes, D. P. (2005). The effects of strategic decision making on entrepreneurial self-efficacy. *Entrepreneurship Theory and Practice*, 29(5), 599-626.

Free, C. (2007). Supply-chain accounting practices in the UK retail sector: Enabling or coercing collaboration? *Contemporary Accounting Research*, 24(3), 897-933.

Gagné, M., & Forester, J. (2008). The study of compensation systems through the lens of self-determination theory: Reconciling 35 years of debate. *Canadian Psychology*, 49(3), 225-232.

Gibbert, M., & Ruigrok, W. (2010). The "what" and "how" of case study rigor: Three strategies based on published work. *Organizational Research Methods*, 13(4), 710.

Gibbert, M., Ruigrok, W., & Wicki, B. (2008). What passes as a rigorous case study? *Strategic Management Journal*, 29(13), 1465-1474.

González-Romá, V., Fortes Ferreira, L., & Peiró, J. (2009). Team climate, climate strength and team performance. A longitudinal study. *Journal of Occupational and Organizational Psychology*, 82(3), 511-536.

Granlund, M. (2001). Towards explaining stability in and around management accounting systems. *Management Accounting Research*, 12(2), 141-166.

Hartmann, F. G. H., & Maas, V. S. (2011). The effects of uncertainty on the roles of controllers and budgets: An exploratory study. *Accounting and Business Research*, 41(5), 439-458.

HassabElnaby, H. R., Said, A. A., & Wier, B. (2005). The Retention of Nonfinancial Performance Measures in Compensation Contracts. *Journal of Management Accounting Research*, 17(1), 23-42.

Hempel, P. S., Zhang, Z. X., & Han, Y. L. (2012). Team empowerment and the organizational context: Decentralization and the contrasting effects of formalization. *Journal of Management*, 38(2), 475-501.

Hunton, J. E., & Price, K. H. (1994). A framework for investigating involvement strategies in accounting information systems development. *Behavioral Research in Accounting*, 6((supplement)), 128-157.

Hunton, J. E., & Price, K. H. (1997). Effects of the user participation process and task meaningfulness on key information system outcomes. *Management Science*, 43(6), 797-812.

Judge, T. A. (2007). Self-efficacy and work-related performance: The integral role of individual differences. *Journal of Applied Psychology*, 92(1), 107-127.

Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard - Measures that drive performance. *Harvard Business Review*, 70(1), 71-79.

Kaplan, R. S., & Norton, D. P. (1996). Using the balanced scorecard as a strategic management system. *Harvard Business Review*, 74(1), 75-85.

Kaplan, R. S., & Norton, D. P. (2000). Having trouble with your strategy? Then map it. *Harvard Business Review*, 78(5), 167-176.

Kennerley, M., & Neely, A. (2002). A framework of the factors affecting the evolution of performance measurement systems. *International Journal of Operations & Production Management*, 22(11), 1222-1245.

Kennerley, M., & Neely, A. (2003). Measuring performance in a changing business environment. *International Journal of Operations & Production Management*, 23(2), 213-229.

Kleingeld, A., Van Tuijl, H., & Algera, J. A. (2004). Participation in the design of performance management systems: A quasi-experimental field study. *Journal of Organizational Behavior*, 25(7), 831-851.

Latham, G. P., Winters, D. C., & Locke, E. A. (1994). Cognitive and motivational effects of particiation - A mediator study. *Journal of Organizational Behavior*, 15(1), 49-63.

Lillis, A. M. (2002). Managing multiple dimensions of manufacturing performance - An exploratory study. *Accounting, Organizations and Society*, 27(6), 497-529.

Lillis, A. M., & Mundy, J. (2005). Cross-sectional field studies in management accounting research - Closing the gaps between surveys and case studies. *Journal of Management Accounting Research*, 17(119-141.

Lukka, K., & Kasanen, E. (1995). The problem of generalisability: Anecdotes and evidence in accounting research. *Accounting, Auditing and Accountability Journal*, 8(5), 71-90.

Miserandino, M. (1996). Children who do well in school: Individual differences in perceived competence and autonomy in above-average children. *Journal of Educational Psychology*, 88(2), 203-214.

Otley, D. (1999). Performance management: A framework for management control systems research. *Management Accounting Research*, 10(4), 363-382.

Parker, S. K. (2003). Longitudinal effects of lean production on employee outcomes and the mediating role of work characteristics. *Journal of Applied Psychology*, 88(4), 620-634.

Patel, P. (2011). Role of manufacturing flexibility in managing duality of formalization and environmental uncertainty in emerging firms. *Journal of Operations Management*, 29(1-2), 143-162.

Phua, Y. S., Abernethy, M. A., & Lillis, A. M. (2011). Controls as exit barriers in multiperiod outsourcing arrangements. *Accounting Review*, 86(5), 1795-1834.

Proenca, T. (2010). Self-managed work teams: An enabling or coercive nature. *International Journal of Human Resource Management*, 21(3), 337-354.

Said, A. A., HassabElnaby, H. R., & Wier, B. (2003). An Empirical Investigation of the Performance Consequences of Nonfinancial Measures. *Journal of Management Accounting Research*, 15(1), 193-223.

Speckbacher, G., Bischof, J., & Pfeiffer, T. (2003). A descriptive analysis on the implementation of balanced scorecards in German-speaking countries. *Management Accounting Research*, 14(4), 361-387.

Sundin, H., Granlund, M., & Brown, D. A. (2010). Balancing multiple competing objectives with a balanced scorecard. *European Accounting Review*, 19(2), 203-246.

Vlaar, P. W. L., Van den Bosch, F. A. J., & Volberda, H. W. (2006). Coping with problems of understanding in interorganizational relationships: Using formalization as a means to make sense. *Organization Studies*, 27(11), 1617-1638.

Wouters, M. (2009). A developmental approach to performance measures - Results from a longitudinal case study. *European Management Journal*, 27(1), 64-78.

Wouters, M., & Roijmans, D. (2011). Using prototypes to induce experimentation and knowledge integration in the development of enabling accounting information. *Contemporary Accounting Research*, 28(2), 708-736.

Wouters, M., & Sportel, M. (2005). The role of existing measures in developing and implementing performance measurement systems. *International Journal of Operations & Production Management*, 25(11), 1062-1082.

Wouters, M., & Wilderom, C. (2008). Developing performance-measurement systems as enabling formalization: A longitudinal field study of a logistics department. *Accounting, Organizations and Society*, 33(4-5), 488-516.

TABLES

Table 1: Organizational characteristics

	Case A				**Case B**			
Industry and sector	Manufacturing, chemical industry				Manufacturing, water supply			
Ownership	Listed company				Semi-government company			
Size								
▪ # employees	2,000				700			
▪ # locations in Belgium	5				2			
Market	B2B and B2C				B2B and B2C			
Financial performance [A]	2007	2008	2009	2010	2004	2005	2006	2007
▪ Turnover (euros)	663,800,000	931,900,000	571,400,000	600,400,000	83,240,956	118,713,413	153,136,417	157,785,517
▪ Profit (euros)	49,800,000	88,400,000	-150,600,000	175,200,000	10,361,528	9,718,183	15,774,914	6,438,994
▪ Ratio (profit/ turnover)	13.33%	9.49%	-26.36%	29.18%	12.45%	8.18%	10.30%	4.08%
Introduction BSC	December 2007				September 2004			

[A] To indicate financial performance, the year in which the BSC is developed and the three years following have been selected.

Table 2: Data gathering

	Case A	Case B	Consulting company
First round of interviews			2 interviews with consultant 1
Second round of interviews	1 top manager	1 top manager	
Third round of interviews (middle managers)	1 supply chain manager 1 facility manager 1 raw materials procurement manager 1 support services department head 1 order-to-cash manager 2 production managers 1 planning optimizer	1 supply chain manager 1 facility manager 1 raw materials procurement manager 3 support services department heads 1 order-to-cash manager 2 production managers 2 distribution managers	
Fourth round of interviews			1 interview with Consultant1 and 1 interview with Consultant 2
Internal documents	Balanced scorecard, strategy map, organizational chart	Balanced scorecard, strategy map, organizational chart, agenda of BSC meetings	Schedule of meetings and workshops to develop the balanced scorecard
Public information	Website information	Website information	

Table 3: Middle managers interviewees' specifications

Who	Case	Job title	Interview duration	Gender
Interviewee 1	Case A	Raw materials procurement manager	1h06min	Female
Interviewee 2	Case A	Planning optimizer	1h00min	Male
Interviewee 3	Case A	Supply chain manager	0h45min	Male
Interviewee 4	Case A	Production manager	1h25min	Male
Interviewee 5	Case A	Support services department head	0h58min	Male
Interviewee 6	Case A	Production manager	0h45min	Male
Interviewee 7	Case A	Facility manager	0h55min	Male
Interviewee 8	Case A	Order-to-cash manager	1h01min	Male
Interviewee 9	Case B	Supply chain manager	1h24min	Male
Interviewee 10	Case B	Support services department head	0h57min	Male
Interviewee 11	Case B	Production manager	1h30min	Female
Interviewee 12	Case B	Support services department head	1h54min	Female
Interviewee 13	Case B	Order-to-cash manager	1h05min	Female
Interviewee 14	Case B	Raw materials procurement manager	1h00min	Male
Interviewee 15	Case B	Production manager	1h17min	Male
Interviewee 16	Case B	Distribution manager	1h25min	Male
Interviewee 17	Case B	Facility manager	1h30min	Male
Interviewee 18	Case B	Distribution manager	1h06min	Female
Interviewee 19	Case B	Support services department head	1h16min	Male

Table 4: Quotes on the perception on the BSC as an enabling technology

Interviewee (job title)	Case	Quote	Enabling feature	Ef-fect
INTERNAL TRANSPARENCY				
Interviewee 1 (Raw materials procurement manager)	Case A	"On the BSC, there are just too many numbers. It is not handy when you want to communicate this information to colleagues and subordinates."	Internal transparency	-
Interviewee 3 (Supply chain manager)	Case A	"The definition of the critical success factors defined are rather vague. In addition, we can use some of these figures, but there are still things we miss. There are also other needs that must be taken into consideration. Because the critical success factors are vaguely defined, it is hard to control the department using these factors and the BSC."	Internal transparency	-
Interviewee 12 (Support services department head)	Case B	"There is a document from which we can easily conduct our performance indicators. In our department's card we can filter out on certain key performance indicators. We can see how close we are to the target. Everything becomes clear, which facilitates the preparation and course of a review meeting. The BSC has all the information I need to control my department. It highlights points that need to be taken into consideration at all times."	Internal transparency	+
Interviewee 16 (Distribution manager)	Case B	"It is much easier to control the department because the BSC and the performance measures give an indication of how the department is doing. Everything has become much more concrete."	Internal transparency	+
FLEXIBILITY				
Interviewee 7 (Facility manager)	Case A	"The BSC is too lumbering. It takes too long to make the necessary adaptations."	Flexibility	-
Interviewee 10 (Support services department head)	Case B	"Another advantage of the BSC is that you have the opportunity to constantly adapt. It is not a fixed	Flexibility	+

		framework. Don't get me wrong the BSC gives you a framework, but if situations in your department change, it is easy to adapt the BSC according to the changes that occurred in your department."		
Interviewee 12 (Support services department head)	Case B	"It is possible for us as department to make changes to the scorecard if necessary. It really is our card. I can really find my department in it; therefore, it is a very useful instrument."	Flexibility	+
Interviewee 14 (Raw materials procurement manager)	Case B	"We get the opportunity to adapt on a regular basis the key performance indicators. We discuss as a group whether it would be beneficial to add or remove some measures… We definitely have sufficient opportunity to propose and make changes."	Flexibility	+
REPAIR				
Interviewee 7 (Facility manager)	Case A	"People know who controls the organization. However, if you start looking at the BSC to make decisions, you draw incorrect conclusions."	Repair	-
Interviewee 9 (Oder-to-cash manager)	Case B	"We see that there are department and corporate meetings. These are organized in a different way, how we communicate with the top management has changed. We talk about the measures and actions that could be undertaken when our BSC has a red dot… The BSC offers the opportunity to draw some numbers on a frequent basis. As a result, it is much easier to react because now you know what is going on."	Repair	+
Interviewee 14 (Raw materials procurement manager)	Case B	"It is much easier now (when using the BSC) to define action plans and to adapt processes when you notice things should run differently."	Repair	+
Interviewee 18 (Distribution manager)	Case B	"It is not possible to see how the organization is doing and define action plans because everything is changing too fast. In addition, I do not believe we always have the correct indicators."	Repair	-

GLOBAL TRANSPARENCY				
Interviewee 6 (Production manager)	Case A	"The idea of providing a clear view of the organization and the strategy using the BSC is beautiful; however, it is difficult to accomplish this."	Global transparency	-
Interviewee 8 (Order-to-cash manager)	Case A	"It is not possible to obtain a better view of how the organization is working and what the organization wants to accomplish by looking at the BSC."	Global transparency	+
Interviewee 9 (Supply chain manager)	Case B	"The BSC makes it possible to detect who is dependent on whom. This not only within each department but also between departments. It is easier for people to determine their place within the organization. You can see your place in the company as a whole much more quickly. In addition, you better know the consequences of your actions and you can take them into account."	Global transparency	+
Interviewee 15 (Production manager)	Case B	"The BSC helps to give a clear view of the organization. It is much easier to obtain a view of a department when looking at its BSC."	Global transparency	+

Table 5: Perception of the BSC as enabling formalization

Features of BSC as an enabling technology	**Internal transparency**	**Repair**	**Flexibility**	**Global transparency**
Managers' perception Case A	–	–	–	–
Managers' perception Case B	+	+	+	+ +

"++" all or all but one statement indicate the presence of the feature

"- -" all or all but one statement indicate the absence of the feature

"+" more than half of the statements indicate the presence of the feature; however there are at least two statements that indicate the absence of the feature

"-" more than half of the statements indicate the absence of the feature; however there are at least two statements that indicate the presence of the feature

Table 6: Participation during BSC development

Interviewee (job title)	**Case**	**Perception of BSC**	**Mode of participation**
PANEL A			
Interviewee 1 (Raw materials procurement manager) *"Instead of implementing the BSC top-down, it would have been better implemented bottom-up. In some parts of the organization they already had some key performance indicators. It would have been better to use those, rather than proposing new ones."*	Case A	Not enabling	Pseudo
Interviewee 2 (Planning optimizer) *"After two or three sessions, you have finally created a BSC, which is then proposed to the management. The things top management don't like are removed from the scorecard, and some things we 'forgot' are added. In this way, you are not the dominant coalition; you are the dominated coalition."*	Case A	Not enabling	Pseudo
Interviewee 3 (Supply chain manager) *"When we came back in the room after the break of the workshop on critical success factors, top management proposed some factors. All the proposals we made were wiped off. The whole process felt like everything was already determined upfront."*	Case A	Not enabling	Pseudo
Interviewee 4 (Production manager) *"I got involved in the development process. I had the opportunity to give content to the strategy. And the strategy was used to make a BSC. I also had a large influence on that"*	Case A	Enabling	True
Interviewee 5 (Support services department head) Was not involved from the beginning of the developmental phase.	Case A	Not enabling	N/A[b]
Interviewee 6 (Production manager) *"We were already using performance measures. During the (development) discussion, we were able to show that these measure were important for the organization. The other performance measures that they (top management) found important - only one or two – we have also included in the BSC."*	Case A	Enabling	True

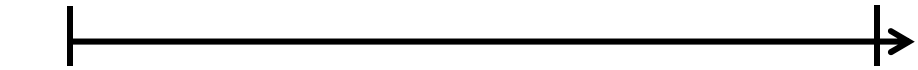
Interviewee 7 (Facility manager) *"Cohesion is also very important. There must be a link between what could be found on paper, and the cooperation and depth. This is a problem."*	Case A	Not enabling	Pseudo
Interviewee 8 (Order-to-cash manager) *"The results (from the workshop) did not surprise me. However, afterwards, top management put some things forward that did not match with what we proposed. This raises some questions because we only proposed minor changes, with small influence on the strategy."*	Case A	Not enabling	Pseudo
PANEL B			
Interviewee 9 (Supply chain manager) *"(During the development process) everyone felt important. Important might not be the correct word, but everyone felt that their input was taken into account and they could draw part of the picture of our company."*	Case B	Enabling	True
Interviewee 10 (Support services department head) *"(During the development process) you can steer and give directions. You also determine the things. … You get encouraged to think about the strategy, and are expected to give your view on it. It is not that someone for top management tells you what to do, you are the one with the role of executor. You give input and are allowed to also determine the direction."*	Case B	Enabling	True
Interviewee 11 (Production manager) *"I have been involved with the development of the BSC. I think this is important that you and other people in your department get involved and can give your opinion on this matter.* *We worked together in small groups to discuss important topics and used the outcome to put our BSC together."*	Case B	Not enabling	True
Interviewee 12 (Support services department head) *"I was able to contribute to the development of the BSC during the workshops. I helped to create key performance indicators, which made it possible to measure pivotal facets to move the organization toward a better execution of the strategy."*	Case B	Enabling	True

Interviewee 13 (Order-to-cash manager) *"During the development, we had a very open discussion. I also participated in those groups, but I must say I was not dominant in the process. We were with more people and together we formed a complementary team. This made it possible to create a BSC. I think it was good to do it that way."*	Case B	Not enabling	True
Interviewee 14 (Raw materials procurement manager) Was not involved from the beginning of the developmental phase.	Case B	Enabling	N/A[b]
Interviewee 15 (Production manager) *"I have been appointed to participate in the process, but I did not mind; it shows that the they (top management) feel I am important. … We have been able to give a proposal bottom-up in which we indicate what we as department find important. It was not forced upon us. Top management has made the central scorecard by taking things important for them from the scorecards the different departments had put forward."*	Case B	Enabling	True
Interviewee 16 (Distribution manager) *"My name was raised when it was decided who would participate in the process. However, I did not experience it as an obligation. I wanted to do it. … I have been able to be actively involved, and they also listened to what I had to say."*	Case B	Enabling	True
Interviewee 17 (Facility manager) Was not involved from the beginning of the developmental phase.	Case B	Enabling	N/A[b]
Interviewee 18 (Distribution manager) *"We had the opportunity to follow the whole process and make a proposition ourselves. There was no top-down implementation."*	Case B	Enabling	True
Interviewee 19 (Support services department head) Was not involved from the beginning of the developmental phase.	Case B	Enabling	N/A[b]

[b] N/A: not applicable (the manager was not involved from the beginning of the developmental phase)

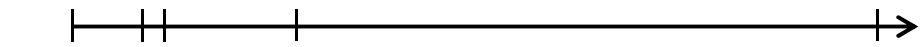
FIGURES

Figure 1: Data collection time-line



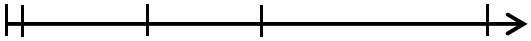
February 2009 *September 2010*

Listed company:



1 2 3 4 5

Semi-government company:



12 3 4 5

1 = interview consultant 1 (1st round)
2 = interview top manager (2nd round)
3 = first interview middle manager (3rd round)
4 = last interview middle manager (3rd round)
5 = second interview consultant 1
and interview consultant 2 (4th round)

CHAPTER 3 – THE EFFECT OF ENABLING PERFORMANCE MEASUREMENT SYSTEMS ON AUTONOMOUS MOTIVATION, CONTROLLED MOTIVATION AND MANAGERIAL PERFORMANCE

ABSTRACT

After decades of research, studies on performance measurement systems (PMSs) still deliver ambiguous results. The relevance of different types of PMSs and motivational mechanisms to explain the effect of management control systems on managerial outcomes has become more salient over the last few years. The purpose of this paper is to investigate whether and how PMSs designed as an enabling formalization affects managerial performance. Drawing on the self-determination theory we build a research model and describe the motivational mechanisms that play a pivotal role in the PMS-performance relationship. In addition, we develop a scale to measure the degree to which a PMS is perceived as an enabling formalization and use the scale to test the relationships hypothesized in our research model using questionnaire data obtained from 186 managers.

Our results show that the proposed scale to measure an enabling PMS is adequate. In addition, we find that an enabling PMS impacts performance indirectly, through autonomous motivation. Controlled motivation, by contrast, has no significant explanatory power in the PMS-performance relationship.

Keywords: enabling formalization, performance measurement system, motivation, autonomous motivation, structural equation modelling

1. INTRODUCTION

It has long been recognized that performance measures influence behaviour (Burney, Henle, & Widener, 2009; Neely, Mills, Platts, Gregory, & Richards, 1994). Nevertheless, the effect of a performance measurement system (PMS) on performance is still poorly understood (Bourne, Melnyk, & Faull, 2007; Pavlov & Bourne, 2011). To address this topic Franco-Santos and Bourne (2005) argue that the *use* of a PMS is an important process factor that will influence managerial behaviour. Moreover, the use of the PMS determines whether the PMS will contribute to the performance of the organization (Henri, 2006). Based on key factors that determine the use of a PMS, different typologies have been developed (Franco-Santos, Lucianetti, & Bourne, 2012; Speckbacher, Bischof, & Pfeiffer, 2003; Wiersma, 2009). As such, scholars have tried to determine the most appropriate type of PMS to help organizations manage their performance. These typologies allow investigation on the benefits and consequences of a PMS; however, the existing typologies are not eligible to all research. For example, although Lee and Yang (2011) used the typology of Speckbacher et al. (2003), Franco-Santos et al. (2012), indicated they were unable to use this typology as it was "too narrow". That the typology cannot be integrated in every situation impedes research on the relationship between PMSs and managerial behaviour. Consequently, a typology that allows to situate all types of PMSs on a continuum is requested.

In this study special attention is dedicated to a PMS perceived as enabling formalization. Enabling formalization offers a solution for the shortcomings of existing typologies of PMSs. It offers the opportunity to develop a clear and comprehensive typology for processual uses of PMSs (Ahrens & Chapman, 2004). Moreover, it offers the possibility to locate all types of PMSs (e.g. balanced scorecard, performance prism, adapted forms of balanced scorecards) on a continuum. The concept enabling formalization was developed by Adler and Borys (1996). These authors defined two types of formalization: coercive and enabling formalization., This typology should not be seen as a dichotomy. A system can embody both coercive and enabling elements (Shadur, Kienzle, & Rodwell, 1999). More specifically, enabling and coercive formalization are defined as the extremes on a continuum of control (Stansbury & Barry, 2007). Bureaucracies and systems on the very left end of the continuum (extremely coercive) have not been frequently associated positively with outcome variables (e.g. Cardinal, 2001; Parker, 2003). Enabling formalization has the opportunity to ameliorate performance (Li, Lee, Li, & Liu, 2010; Parker, 2003; Patel, 2011). Consequently, research should redirect its attention from coercive toward enabling types of formalization (e.g. Vlaar, Van den Bosch, & Volberda, 2006; Wouters &

Wilderom, 2008). As a result, this paper focusses on the right side of the continuum. A scale to easily measure the degree to which a PMS is enabling fails to occur. In the light of this deficiency, the first aim of this study is to develop a scale to measure the degree to which a PMS is perceived as enabling. This scale facilitates the positioning of all PMSs on a continuum indicating the degree to which the PMS is enabling. The second aim of this study is to investigate whether and how an enabling PMS affects managerial behaviour.

Literature has already indicated that a control system developed and used as an enabling formalization can have a positive effect on managerial behaviour (Benner & Tushman, 2002; Helin, Jensen, Sandstrom, & Clegg, 2011; Hempel, Zhang, & Han, 2012; Parker, 2003; Wouters & Wilderom, 2008). However, a direct relationship between a PMS and performance seems to be nonexistent. By contrast, studies on formalization indicated that the effect of PMS on performance will be indirect (Kawakami, MacLachlan, & Stringfellow, 2012; Parker, 2003). Research on formalization and on PMSs has indicated that the effect is more likely to be mediated by a third variable, such as self-efficacy, job tension, mangers' cognition and motivation (Hall, 2008; Parker, 2003). In the prevalent search, a psychological approach has been proposed in this process (Otley, 1999), and motivational variables ought to explain the relationship between PMS and performance (e.g. de Leeuw & van den Berg, 2011; Hall, 2008, 2011). According to Adler and Chen (2011), individual motivation is a robust variable to enrich our understanding of how management control systems can improve performance. Other research in the domain of formalization also indicated the importance of motivation as a mediating variable (e.g. Langfred & Moye, 2004; Weibel, 2007). In addition, psychological research stresses the pivotal role of autonomous and controlled motivation in a work related context (Ankli & Palliam, 2012; Gagne & Deci, 2005). It is only through the introduction of autonomous and controlled motivation that the underlying mediating variable problem can be addressed. Neglecting the existence of different types of motivation and treating motivation as a unidimensional construct might have led to confounding results. Therefore, self-determination theory (SDT), a psychological theory that subdivides motivation into autonomous and controlled motivation, will be used as theoretical underpinning in this study. This theory can potentially address the underlying driver problem (Adler & Chen, 2011).

This paper contributes to the literature in three ways. First, this paper considers the use of PMSs. It is only recently that authors have started to test whether the use of PMSs actually creates value (Franco-Santos & Bourne, 2005). Scholars devoted particular importance to the type of PMS in use (Ahrens &

Chapman, 2004; Kolehmainen, 2009; Naranjo-Gil & Hartmann, 2006; Speckbacher et al., 2003; Wiersma, 2009). We extend on existing research by investigating whether an enabling use of a PMS affects performance. Second, previous research has argued that the relation between a PMS and performance is an indirect one. Therefore, gaining insight into the effect of the use of a PMS on managerial behaviour is indispensable. Psychological variables, and more specifically motivational variables, have been proposed to explain the underlying relationship between PMS and performance (Adler & Chen, 2011; Hall, 2008). In addition, by integrating autonomous and controlled motivation, we can deal summarily with the possibility of the inclusion of a confounding variable.

Third, we will develop and use a scale to investigate whether a PMS is perceived as an enabling formalization. Through application of the scale the influence of a PMS on managerial behaviour will be examined. The development of this scale makes it possible to respond to the call of Bisbe et al. (2007) to create constructs that have a sound conceptual specification before being fitted in explanatory models.

The remainder of this paper is structured as follows. In the section 'literature review and hypotheses development', the related literature on the concept of enabling PMSs is outlined. In addition, motivation is proposed as an underlying driver in the relationship between PMSs and managerial performance. A review on the evolution of the concept motivation is delineated. In the final part of this section the theoretical framework and the research hypotheses will be presented. In the method section, details about the research data and design are described. Next, a section will be devoted to the results and discussion of the findings. Finally, this paper ends with a summary of the findings, combined with an overview of the limitations, indications for future research, and practical implications of this research.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. ENABLING PERFORMANCE MEASUREMENT SYSTEM

Originally the concept enabling has been developed in a work process context. According to Adler and Borys (1996), formal procedures do not have to be designed to make the work process foolproof; they could also be designed to enable employees to master their tasks and deal more effectively with its inevitable contingencies. This latter type of formalization is called enabling, and is identifiable by four features: repair, internal transparency, global transparency, and flexibility (Adler & Borys, 1996). *Repair* generates procedures that facilitate responses to real work contingencies. Breakdowns and repairs identify problems with formal procedures and become opportunities for improvement. *Internal*

transparency means that users need both an understanding of the logic of the equipment's internal functioning and information on the equipment's status. *Global transparency* refers to technologies that are programmed to provide operators with extensive information relating to the status of the broader production process. *Flexibility* holds that machines are programmed to give advice and make suggestions, but it is the responsibility of the user to make controlling decisions after the system has displayed the requisite data (Adler & Borys, 1996).

In their paper, Adler and Borys (1996) indicated that the conceptualization of enabling and coercive formalization could also be used in other contexts. In 2004, Ahrens and Chapman translated the concept of enabling formalization and its features to a management accounting context. Other scholars have followed their reasoning, and investigated management control systems using the features developed by or adapted from Adler and Borys's (1996) enabling formalization (e.g. Chapman & Kihn, 2009; Cools, Emmanuel, & Jorissen, 2008; Davila, Foster, & Li, 2009; Free, 2007; González-Romá, Fortes Ferreira, & Peiró, 2009; Hartmann & Maas, 2011; Proenca, 2010; Sundin, Granlund, & Brown, 2010; van der Meer-Kooistra & Scapens, 2008; Wouters, 2009; Wouters & Roijmans, 2011; Wouters & Wilderom, 2008). Several subdomains of the management control system context have been scrutinized. Budget systems (Chapman & Kihn, 2009; Hartmann & Maas, 2011), self-managed work teams (Proenca, 2010), transfer pricing (Cools et al., 2008), development of PMSs (Wouters & Roijmans, 2011; Wouters & Wilderom, 2008), multiple objectives in the design and use of PMSs (Sundin et al., 2010), have been subject of research in which the framework of Adler and Borys (1996) has been used as key to explain the findings. As such, a definition of the concept enabling has also been developed in the management accounting system domain. In general, a PMS as enabling formalization, is one that is perceived by employees as facilitating their responsibilities, rather than primarily as control devices for use by senior management (Wouters & Roijmans, 2011). In this definition special attention should be given to the term "perceived". An enabling PMS is conceptualized as individual managerial perceptions. In 1999, Liker, Collins, and Hull already stated that rules could sometimes be perceived as coercive and sometimes be perceived as enabling. This indicates the importance of the perception of the manager that the PMS is enabling. The underlying logic is that managers individually perceive and interpret the PMS, which is used in their organization, and base their individual attitudinal and behavioural reactions on these individual perceptions (Franco-Santos et al., 2012).

The relating features of an enabling formalization (repair, internal transparency, global transparency, and flexibility) have less frequently been adapted to the management control system context. Scholars often used their own typology of characteristics to measure enabling formalization (e.g. Hoy & Sweetland, 2001; Wouters & Wilderom, 2008). This has resulted in a wide range of variables used to define enabling systems. Consequently, it is hard to lucidly delineate all findings in this domain. Only few scholars used the original features to determine the degree to which a system is perceived as enabling (e.g. Chapman & Kihn, 2009; Hartmann & Maas, 2011). However, in those studies the topic addressed was the budget, not the PMS. Hence, the developed items are related to the budget and the budget systems. In this paper we want to create an operationalization of the concept of a PMS perceived as enabling. A uniform scale to measure the degree in which a PMS is perceived as enabling can contribute to the repeatability and lucidity of current and future research. In addition, we want to show the relevance of the concept of enabling in investigating the effectiveness of PMS on motivation and performance.

2.2. MOTIVATION

The SDT does not look at motivation as a unitary concept, as many psychological theorists have done (Ryan & Deci, 2000). Different types of motivation can be distinguished. In this paper we will categorize motivation as autonomous or controlled motivation. Both autonomous and controlled motivation consist of different types of motivation. The types the SDT uses are all linked to either intrinsic or extrinsic motivation. Intrinsic and extrinsic motivation are two overarching types of motivation in the SDT (Gagne et al., 2010). Intrinsic motivation refers to doing an activity for the inherent satisfaction of the activity itself (Ryan & Deci, 2000). An intrinsically motivated employee is genuinely interested in his job and experiences enjoyment while working (Van den Broeck, Vansteenkiste, & De Witte, 2008). Extrinsic motivation, on the other hand, is defined as doing something for instrumental reasons (Gagne et al., 2010). Under this type of motivation people work in response to something apart from the work itself, for example a reward, recognition, or dictates of other people (Amabile, 1994). Even though a clear distinction between these two types of motivation can be made, the instrumental reasons within extrinsic motivation can vary greatly. Therefore, motivation in the SDT has been divided in several types of regulation. Regulation concerns the motivational processes that organize and direct behaviours and is reflected in people's reasons for engaging in the behaviours (Vansteenkiste, Ryan, & Deci, 2008). Extrinsic motivation can be divided in four types of regulation: external regulation, introjected regulation, identified regulation, and integrated regulation (Ryan & Deci, 2000). Within *external*

regulation people are motivated to obtain a reward or to avoid a punishment (Vansteenkiste, Niemiec, & Soenens, 2010). *Introjected regulation* refers to the regulation of behaviour through self-worth contingencies such as ego-involvement and guilt (Gagne et al., 2010). Within this type of regulation, an employee works for example to impress colleagues, the boss, family. When people understand and endorse the personal value and significance of a behaviour, and as a result, experience a sense of freedom in doing it; they have extrinsic motivation under the form of *identified regulation* (Vansteenkiste et al., 2010). Under identified regulation employees perform tasks within their job, not because they really like doing those tasks, but, for instance, because they know the organization will only perform well when those tasks are done. The last form of extrinsic motivation is *integrated regulation*, which refers to identifying with the value of an activity to the point that it becomes habitual and part of the person's sense of self (Gagné & Forest, 2008). In this situation, an employee's own goals and values coincide with the goals of the company.

Distinguishing between these different types of regulation is necessary, because the type of regulation influences the outcome variables, such as performance, well-being, and job satisfaction. In the SDT, the existence of different types of regulation have resulted in the replacement of the intrinsic/extrinsic dichotomy by autonomous and controlled motivation (Roth, Assor, Kanat-Maymon, & Kaplan, 2007). The latter categorization is more powerful to make predictions on performance than previously developed categorizations (Vansteenkiste et al., 2008), as the distinction between autonomous and controlled motivation better represents the link with the underlying regulatory processes and accompanying experiences of the different types of motivation (Gagne & Deci, 2005) underlying feelings, and locus of causality (Vansteenkiste et al., 2010). Through this alignment of underlying regulatory processes, accompanying experiences, underlying feelings, locus of causality, a clear view on how motivation influences performance can be created.

Identification, integration, and intrinsic motivation represent autonomous motivation (Gagne et al., 2010). When for example looking at the resulting consequences, identified motivation and integrated regulation are more related to intrinsic motivation than to the other two types of extrinsic motivation (external and introjected regulation). Moreover, identified and integrated regulation are together with intrinsic motivation, the types of motivation which are driven by an internal locus of causality. In addition, these three types of motivation have the same underlying feelings (volition and freedom). Being autonomously motivated means being motivated by one's interest in an activity (i.e., intrinsic regulation) and/or because one realises the importance of the activity to his/her organization or himself/herself (i.e., identified or integrated regulation). External and introjected regulation, on the

contrary, are driven by stress and pressure, and both types of motivation have an external locus of causality (Vansteenkiste et al., 2010). External and introjected regulation involve the regulation of behaviour with the experiences of pressure and coercion to think, feel, or behave in particular ways (Vansteenkiste et al., 2010). In the controlled versus autonomous motivation categorization, external regulation and introjection represent controlled motivation.

2.3. HYPOTHESES DEVELOPMENT

Previous research indicated that an enabling formalization can have a positive effect on managerial outcomes (Benner & Tushman, 2002; Helin et al., 2011; Hempel et al., 2012; Parker, 2003; Wouters & Wilderom, 2008). Nevertheless, research on the effect of an enabling PMS on performance has delivered equivocal results. Therefore, scholars suggest the introduction of motivation as a mediating variable in this relationship. However, to make good predictions on performance outcomes, motivation should not be treated as a unitary concept. The SDT indicates differentiation between autonomous and controlled motivation to facilitate proper prediction building (Vansteenkiste et al., 2008). As the resulting types of motivation, autonomous and controlled motivation, are associated with different underlying feelings (Gagne & Deci, 2005), behaviours for engaging (Vansteenkiste et al., 2008), and resulting outcomes (e.g. Vansteenkiste et al., 2010; Wong-On-Wing, Guo, & Lui, 2010), these types of motivation will intertwine the relationship between an enabling PMS and performance differently.

Adler and Borys (1996) already indicated that autonomous motivation is positively associated with identified motivation. They base their prediction on the research of Ryan and Connell (1989), who indicated that with identified motivation people internalize goals and the discipline necessary to reach those goals. Autonomous motivation will be improved when the three basic psychologival needs are supported (Deci & Ryan, 2000; Gagné & Forest, 2008). These three basic psychological needs comprise the need for relatedness, competence, and autonomy. Relatedness refers to the desire to feel connected to others (Baumeister & Leary, 1995). The need for competence represents an individuals' desire to feel effective in interacting with the environment (Deci & Ryan, 2000; Van den Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2010). The need for autonomy means that the employee has the need to feel rational and to experience a sense of choice and psychological freedom when carrying out the activity (Deci & Ryan, 2000; Van den Broeck et al., 2010). Even when employees have to follow others' requests and depend on others, they can still experience autonomy satisfaction (Van den Broeck et al., 2010). Consequently, these needs can be fulfilled in a work context in which an enabling PMS is

used. The opportunity to react through repair possibilities will give the users of the PMS a feeling of autonomy. When the PMS gives managers indication on the performance measures, and offers managers possibilities to solve problems, managers will experience freedom as they can choose the actions based on the information. This supports the need for autonomy. Since accurate information is delivered to identify and implement actions, the manager's need for competence will be satisfied. Managers' understanding of the PMS itself and of its underlying rational (internal transparency) will support the feeling of competence. The users of an enabling PMS often experience a clear view on the organization (global transparency). This can enhance the feeling of relatedness as they have a good indication of how their function fits the organization as a whole. Flexibility, which holds that managers are actively involved in the development and use of the PMS will give managers a feeling of autonomy, as they get discretion over the system. As a result, an enabling PMS holds the opportunity to augment the three basic psychological needs. Hence autonomous motivation can increase. Based on the argumentation outlined above, we hypothesize that:

Hypothesis 1a: A PMS used as an enabling formalization is positively related to the level of autonomous motivation.

Controlled motivation, on the other hand, is expected to be higher when employees encounter feelings of stress and pressure. Moreover, an external locus of causality is associated with controlled motivation (Vansteenkiste et al., 2010). By contrast, an enabling PMS, in which the features are highly supported, avoids a situation in which the users feel pressured and stressed. As stated above, repair possibilities, flexibility, global and internal transparency support the three basic psychological needs. Subsequently, the level of autonomous motivation can increase. Therefore, we expect no positive relation between an enabling PMS and controlled motivation. On the contrary, the more enabling the PMS, the less likely the managers will seek for external pressures such as rewards, promotion opportunities and deadlines to augment their motivational level. The more enabling the PMS, the smaller the feelings of pressure and stress. Consequently, we expect that a PMS used as an enabling formalization will be associated with a low amount of controlled motivation. Based on the reasoning above, we formulted the following hypothesis:

Hypothesis 1b: A PMS used as enabling formalization is negatively associated with the level of controlled motivation.

The SDT literature has shed some light on the expected relationship between motivation and performance, which has confirmed the relevance of the bifurcation of motivation in autonomous and controlled motivation. Research on the relationship between the different types of motivation and performance has been opulent. Previous studies argue that autonomous, more than controlled motivation, is associated with greater performance (e.g. Vansteenkiste et al., 2010; Wong-On-Wing et al., 2010). Despite the difference in level of influence, both autonomous and controlled motivation are associated with active involvement (Vansteenkiste et al., 2010). As a result, we argue that both autonomous and controlled motivation are positively associated with managerial performance, and hypothesize that:

Hypothesis 2a: The level of autonomous motivation is positively associated with managerial performance.

Hypothesis 2b: The level of controlled motivation is positively associated with managerial performance.

All these relationships can be found in the research model shown in Figure 1.

"Insert Figure 1 here"

3. METHOD

We gathered data through an online questionnaire survey conducted in Belgium and used structural equation modelling to test out hypotheses. In particular, we investigate (1) whether a PMS used in an enabling way improves performance, and (2) whether and how autonomous and controlled motivation influence this relationship. We also further elaborate on the development of items to create a construct to measure the degree in which a PMS is perceived as an enabling technology.

3.1. DATA AND SAMPLE

To endorse the appropriateness of this quantitative research and the data collection, we employ best practice data collection techniques (Chenhall & Smith, 2011). Therefore, we follow the suggestions made by Dillman (2000) and introduce different pre-tests. First, the questionnaire was pre-tested by two business professors, one psychology professor, and one strategic management consultant. These experts were asked to evaluate and give suggestions to improve the face validity of the questionnaire. Second, two first-level managers filled out the questionnaire to evaluate the understandability, clarity,

and ambiguity of the survey. At the same time, they pre-tested the online version of the questionnaire. This enabled us to detect problems with the use of the online questionnaire. When the two first-level managers tested the survey, one of the authors was present to observe difficulties in filling out the questionnaire. In addition, the managers had the possibility to ask questions whenever they thought items or questions were unclear. Afterwards the author asked them about the difficulties they perceived while filling out the questionnaire. Third, the online version of the questionnaire was sent to 36 managers, participating in a course "Economics for non-economists". Six managers, or 16.67%, returned the questionnaire. On the basis of these different pre-tests minor adaptations to the formulation of some items were made to improve understandability and clarity, and to reduce ambiguity.

Data were collected using a questionnaire administrated to managers of Belgian organizations. We obtained a list of 2,150 managers from a commercial mailing list provider. The 2,150 managers have been selected from a database containing 202,779 organizations. This database is chosen as starting point, as it offers personal e-mail addresses of managers. As a result, we were offered the opportunity to directly contact respondents employed at a managerial level. Within this database we selected e-mail addresses from managers working in an organization located in the Dutch speaking part of Belgium, as the questionnaire has been developed in Dutch. Moreover, as the focus is on organizations with a performance measurement system, only organizations with a work force of at least 100 employers are retained for this research. Organizations with less than 100 employees are more likely to be small-scaled or family-owned, hence less likely to use a PMS. Within the resulting amount of potential organizations, 926 different organizations were selected. Within each organization one to six managers were randomly selected. Managers within the same company were located in different business units, holding different functions. The selection procedure eventually resulted in a data base of 2,150 respondents. We chose members of the management team as informants since they should be knowledgeable about the performance measurement system. These managers were sent an e-mail to ask their participation in the survey. To encourage completion of the questionnaire, participants were promised a summary of the results. In addition, we informed the participants that their responses were anonymous. Of the 2,150 e-mails sent, 178 did not reach the participant due to incorrect e-mail address or due to firm leave. Of the 1,972 surveys that reached respondents, 796 persons opened the link to the survey. In total 289 (14,65% of the reached respondents) returned the questionnaire. The response rate is similar to other accounting research (e.g., Artz, Homburg, & Rajab, 2012; Widener, 2007).

To control for non-response bias two tests were performed. First, early respondents (first 10%) were compared to late respondents (last 10%) for all demographic and model variables. This untabulated analysis showed that there were no significant differences for any of the variables. Second, we investigated non-response bias by comparing the sector and industry classification of respondents and non-respondents. The commercial list of 2,150 managers was used as a guide, as the list holds a random selection of respondents of a database which is representative toward the Dutch speaking part of the Belgian firm landscape. A χ^2-test shows that the proportion of managers in each sector and industry classification is not significantly different from the original list of 2,150 respondents. Consequently, the results support absence of significant non-response bias.

Demographic information collected from the respondents regards age, gender, company size (number of employees), management level (low, middle or top management), and sector and industry classification. Of all respondents, 186 (64.36%) were employed by a company using a PMS, whereas 103 (35.60%)[1] were working in a company without PMS. For this study, only the responses of the 186 managers employed in a company using a PMS are eligible. Table 1 shows the characteristics of these 186 respondents. An average respondent is 46.5 years old. 86.6% of the respondents is male. The management level where respondents hold their position differs from lower management (5.9%) to top management (66.7%). The average company size is the category 501 to 1,000 employees. Respondents work for organizations in a wide variety of industries, with some concentration in manufacturing (54.3%) and services (27.4%).

"Insert Table 1 here"

3.2. SCALE DEVELOPMENT

A scale to measure the degree to which managers perceive the use of a PMS as *enabling* has not yet been operationalized. In the context of management control systems, the concept of enabling formalization has mainly been used in field research (e.g., Ahrens & Chapman, 2004; Cools et al., 2008; Free, 2007; Proenca, 2010; Sundin et al., 2010; Wouters, 2009; Wouters & Roijmans, 2011; Wouters & Wilderom, 2008). Although, some operationalizations in the management control system field have been executed (Chapman & Kihn, 2009; González-Romá et al., 2009; Hartmann & Maas, 2011), none of

[1] The Belgian landscape is characterized by a large number of well-established rather large family businesses. This explains why 1/3 of the sample indicates his / her organization has no PMS.

those focus on PMSs. More specifically, one general scale to measure whether team work is used in an enabling way (González-Romá et al., 2009), and scales to measure the enabling use of budgeting systems (Chapman & Kihn, 2009; Hartmann & Maas, 2011) have been developed.
As Bisbe et al. (2007) stress the need for a sound conceptual specification of research constructs prior to fitting them to explanatory models, extra attention is paid to the meaning and nature of the construct enabling PMS. Therefore, we give detailed information on the conceptualization and item generation of the scale to measure the degree to which the use of the PMS is perceived as enabling.

The scale development started from theoretical insights. Adler and Borys (1996) defined enabling formalization. These authors used the concept to describe work processes. Enabling formalization is indicated by repair, internal transparency, global transparency, and flexibility. The definition Adler and Borys (1996) gave to these four features is described in Table 2. In 2004, Ahrens and Chapman advocated the introduction of this concept to the accounting literature. Many scholars followed their example (e.g. Chapman & Kihn, 2009; Cools et al., 2008; Free, 2007; González-Romá et al., 2009; Hartmann & Maas, 2011; Proenca, 2010; Sundin et al., 2010; Wouters, 2009; Wouters & Roijmans, 2011; Wouters & Wilderom, 2008). Based on this accounting literature, and taking the original definition of the features into consideration, an extrapolation of the concept of work processes to PMSs is made (Table 2).

"Insert Table 2 here"

A series of indicators have been designed to understand the concept of an enabling PMS. In total 24 interchangeable items were developed and pre-tested (Appendix A). For the final scales, 12 items which are manifestations of the construct remain. All items share an enabling PMS as a common theme, and reflect one of the four features, which delivers a first indication that the construct is reflective (Bisbe et al., 2007). A second indication that an enabling PMS is a reflective construct has to do with the fact that not all features need to be present. In this view, Van der Hauwaert and Bruggeman (2013) give indication that the features are to some extend interchangeable. The items on enabling performance measurement system are measured using a 7-point Likert scale ranging from (1) fully disagree to (7) fully agree. Together these items are able to measure the perception of a PMS as enabling technology. The Cronbach's alpha of the four features are displayed in Table 3. The Cronbach's alpha are good (repair .800; internal transparency .782, global transparency .667, and flexibility .679). The exploratory factor

analysis of the twelve items indicated a single factor solution that explains 77.59% of the variance.[2] Consequently, the concept of enabling PMS has been conceptualized as a global construct rather than a second-order construct or four first-order dimensions. This global construct has a Cronbach's Alpha of .907 and has factor loadings that are all but one above .50.[3]

"Insert Table 3 here"

As mentioned before, the stress is on the term "perceived" as the power of the construct will be for a large extent determined by the perception of the manager. Previous research indicated that although performance measurement systems often have all necessary functionalities to be an enabling technology, these systems are not necessarily perceived as enabling (Van der Hauwaert & Bruggeman, 2013). The PMS will only be effective if employees consider the PMS as enabling (Wouters & Roijmans, 2011). Consequently, it is important to consider the perception of the manager on the PMS.

3.3. MEASURES

Autonomous and *controlled motivation* have been measured using an adapted version of the motivation at work scale (MAWS) (Gagne et al., 2010). Gagne et al. (2010) wanted to extend the possibilities of their scale by making the scale available in different languages. The development and validation of the Dutch version of the MAWS was running when our questionnaire was designed.[4] Since we wanted to work with the Dutch version of the scale that was still under development, we conducted a pre-test on the items under investigation to avoid validity and reliability problems (Appendix B). Of the 12 items in this scale, six are used to measure controlled motivation. The other six items measure autonomous motivation. Factor loadings of the items of the two factors are all but four above .60. Details about the factor loadings can be found in Table 4. The reliability of the factors controlled and autonomous motivation is good, with a Cronbach's alpha of .819 and .749 respectively.

[2] To clarify the elements of this newly developed construct, an exploratory factor analysis should be performed before conducting a confirmatory factor analysis in the structural equation model (Fullerton, Kennedy, & Widener, 2013).

[3] Table 2 shows the factor loadings of enabling PMS from the factor analysis that comprises all dependent and independent variables (enabling PMS, controlled motivation, autonomous motivation, and performance). The exploratory factor analysis of the 12 items on enabling PMS separately has not been integrated in this paper, as it is in the same line as the overall factor analysis.

[4] This scale is validated and published: (Gagné et al., 2014)

"Insert Table 4 here"

Performance was measured using the scale of Mahoney et al. (1965). In this scale managerial performance is measured along nine dimensions. Of those dimensions, the last one measures overall performance. Participants are asked to indicate on a 7-point Likert scale whether their performance is above or below average (1= well below average, 7= well above average). This scale has been used frequently in accounting studies (e.g. Burkert, Fischer, & Schaffer, 2011; Chong & Chong, 2002; Chong & Johnson, 2007; Hall, 2008; Marginson, 2005; Sholihin & Pike, 2009). [5]

4. RESULTS AND DISCUSSION

We examined the research model by conducting confirmatory factor analysis (CFA) using a two-step approach. In a first analysis we evaluated the fit of the measurement model. In a second phase, the structural model was examined. We made use of Lisrel 9.10 to conduct the analyses. As the variables are not normally distributed -but only slightly skewed to the right-, and the sample is not very big, the default estimation method (maximum likelihood) is the most appropriate estimation method.[6]

[5] Although all items load on performance without indication of severe cross loadings, there are three items that display a rather low factor loading (below .60). First, items 7 (measuring performance in negotiating) and item 8 (measuring performance in representing) have a rather low loading. Negotiating is described as purchasing, selling, or contracting for goods or services; tasks negotiations, contacting suppliers, dealing with sales representatives, advertising products, collective bargaining, selling to dealers or customers. Representing in this scale is defined as advancing general organizational interests through speeches, consultation, and contacts with individuals or groups outside the organization; public speeches, community drives, news releases, attending conventions, business club meetings. That these two items (negotiating and representing) have rather low loadings has also been the case in other research (e.g. Hall, 2008). However, as the loading is still reasonable (above .40) we decided not to delete the items for this construct. We argue that it is not unreasonable these items differ from the other items to measure performance in planning, investigating, coordinating, evaluating, supervising, and staffing. Negotiating and representing are often linked to the sales department, and sales is often a different department in many organizations. Therefore it is comprehensible managers rate their performance in this domain differently than toward the other domains the scale distinguishes (planning, investigating, coordinating, evaluating, supervising, staffing). Second, item 2 has a low factor loading. This item measures the performance of managers in relation to how they score themselves on investigating. Investigating is seen as collecting and preparing information, usually in the form of records, reports, and accounts; Inventorying, measuring output, preparing financial statements, recordkeeping, performing research, and job analysis. As this is an important task of a manager and no cross-loading of this item with one of the other constructs has been noted, we decided to leave this item in the measurement.
The items 2, 7, and 8 show no severe deterioration of the construct. In addition, when item 2, item 7, and item 8 were deleted from the analysis, no significant differences could be detected.

[6] Due to the small deviation from normality we also conducted the robust maximum likelihood method, as this method is more robust against violations from non-normality (however more susceptible to small sample sizes). As a result, an asymptotic covariance matrix has been calculated in PRELIS. As the sample size is not

4.1. DESCRIPTIVES

The mean, median, and standard deviation of the dependent and independent variables are shown in Table 5. The correlation coefficients, also displayed in this table, do not exceed the reliability coefficients, providing evidence of discriminant validity (Fullerton et al., 2013). From an untabulated analysis we know that multicollinearity is unlikely since none of the variance inflation factors exceeds 2.0 and the tolerance statistics are all under 1.0.

"Insert Table 5 here"

4.2. MEASUREMENT MODEL

Measurement model fit was evaluated using multiple fit indices as proposed by Hu and Bentler (1999).[7] The root mean square error approximation (RMSEA), the comparative fit index (CFI), the standardized root mean square residuals (SRMR)], and χ^2 / degrees of freedom (df) are selected as complementary measures. The goodness of fit index was not introduced for analysis as it is sensitive to the number of items included in the model (Dekker & Van den Abbeele, 2010). Consequently, the fit of the model would be underestimated by this measure. Instead of this goodness of fit index an incremental fit index such as the comparative fit index should be preferred. The model shows a good fit (Table 6), as a CFI of .95 is combined with a SRMR of .067, and a RMSEA of .057 (Dekker, 2008; Hair, Black, Babin, Anderson, & Tatham, 2006; Hu & Bentler, 1999). Also the χ^2 over the degrees of freedom (764.89 / 489 = 1.564) indicates that the model fits the data well. In behavioural research χ^2 / df < 3 also indicates a good fit (Iacobucci, 2010).

"Insert Table 6 here"

---

normally distributed, the Satorra-Bentler χ^2 is preferred. This measure controls for non-normality. The results from the robust maximum likelihood method were similar to those from the maximum likelihood method.

[7] In this model four variables are measured. The model needs to be theoretically identifiable. The T-rule (Bollen, 1989) indicates the number of unknown parameters needs to be smaller than k (k+1)/2 in which k equals the number of observed variables in the model. In our model there are 72 unknown parameters, and we have 33 observed variables. As a result, the model is theoretically overidentified, if all parameters can be defined uniquely, which makes it possible to test the model.

4.3. STRUCTURAL MODEL

The fit statistics for the structural model are given in Table 7. To investigate the effect of an enabling PMS on performance, and the mediating role of motivation, three different models were tested (Appendix C). The proposed model (= structural model SA) is the model that shows the best fit. The fit statistics indicate that this model reproduces the sample data well. CFI is .95. The RMSEA and SRMR are below the .08 cut-off value (.055 and .069 respectively). χ^2 over df delivers a value of 1.566, which is well below the proposed cut-off value of three.

"Insert Table 7 here"

The structural model SA provides statistical evidence for most of our hypotheses. The path coefficients, t-values, and R^2 statistics of the model SA are depicted in Figure 2 and Table 8. Concerning the impact of an enabling PMS on motivation, evidence for hypothesis 1a has been found. An enabling PMS positively influences autonomous motivation as proposed in hypothesis 1a (t = 5.11). In addition, no confirmation for hypothesis 1b, which states that an enabling PMS has a negative association with controlled motivation, could be found (t = -.73). Indicating the degree in which a PMS is perceived as enabling does not influence the level of controlled motivation. This could be due to the fact that the pressure and stress delivered by a PMS that is not very enabling is smaller than expected. Perhaps the system needs to be more on the left of the continuum toward the extreme coercive side to have any effect on controlled motivation.

"Insert Figure 2 and Table 8 here"

One-tailed Z tests of the equality of coefficients suggest a significant effect of autonomous motivation on performance [p (Z) <.01, t = 3.62]. Controlled motivation on the other hand does not have a significant effect on performance [p (Z) <.05, t = -1.16]. These findings are generally consistent with previous research on autonomous motivation, which indicates that autonomous motivation enhances performance (Baard, Deci, & Ryan, 2004; Mills, 2011; Ryan & Deci, 2000). Furthermore, autonomous motivation has a bigger impact on outcome variables than controlled motivation (Vansteenkiste et al., 2010; Wong-On-Wing et al., 2010). A less positive view on controlled motivation occurred in our research, as a negative, nevertheless, insignificant effect between controlled motivation and performance occurs. This contradicts our hypothesis, as we suspected the effect would be positive. In

short, we can conclude that autonomous motivation explains variability in performance, not controlled motivation. Consequently, evidence for hypothesis 2a, which states that the higher the level of autonomous motivation, the higher managerial performance, has been found. In contrast, no evidence for hypothesis 2b, stating a positive relationship between controlled motivation and performance, has been found. The results do not indicate a positive effect of controlled motivation on performance. The effect is not significant (t = -1.16). As a result, the role of controlled motivation is even smaller than expected. This finding, might be explained by a stream in literature that does not recognize the direct relation between motivation and individual performance. According to scholars in this stream, motivation leads to work involvement or effort (Bonner & Sprinkle, 2002; De Cooman, De Gieter, Pepermans, Jegers, & Van Acker, 2009; Mills, 2011). Moreover, it is through effort that a change in the level of performance is possible (Bonner & Sprinkle, 2002). Given this potential role of effort, we investigated whether the effect of motivation on performance is mediated by effort (Appendix D). From the conducted analyses we conclude that the introduction of effort does not contradict or change any of the findings. The pivotal role of autonomous motivation is stressed in this relation (t = 4.48). Moreover, effort has a positive impact on performance (t = 4.42). In addition, controlled motivation remains marginally non-significant in relation to effort (t = -1.83). Model SD, which includes effort, is not a better (nor a worse) model compared to the original model SA (χ^2 difference = 1.54 < 3.84, α = 0.05). This indicates that effort is an additional explaining factor in this relationship. Although effort is an explaining variable, the introduction of the variable did not alter the sign nor the size of previous found relationships between autonomous motivation, controlled motivation, and performance. Even though the relationship between controlled motivation and effort is non-significant, we should be aware that it is only marginally non-significant.

4.4. Additional analyses

The literature indicates that neglecting the different types of motivation would lead to contradictory results. When we simplify the model and integrate controlled motivation and autonomous motivation together into one factor “motivation”, no relationship between an enabling PMS and performance can be found. Enabling PMS does not predict motivation (t = -1.26). In addition, motivation shows no relationship with performance (t = -1.23). The LISREL output also gives indication of a deterioration of the structural model. The model SE exceeds practically every proposed threshold of the fit indices. CFI (.91) felt below the .95 threshold. Despite the degrees of freedom increased, an augmentation of the χ^2 with 213.66 appeared. Consequently, χ^2 rose to 982.81. Both the AIC (5,675.05) and the χ^2 difference

test (α = .01, 106.83 > 6.63) indicate a tremendous deterioration of model fit compared to model SA. More fit statistics of the structural model SE can be found in Table 7. These findings give ground to the indication in prior studies regarding the power of autonomous motivation as explaining variable in the relationship between management control systems and performance (e.g.; Adler & Chen, 2011; Ankli & Palliam, 2012). Therefore, we argue in favour of the use of autonomous and controlled motivation to investigate the effect of management control systems on managerial behaviour.

Due to the importance of using subcategories of motivation to explain the relationship between enabling PMS and managerial performance, and due to the theoretical indication of the existence of more motivation categories than controlled and autonomous motivation, we tried to control for these different categories. In this way, we wanted to prevent the existence of confounding variables, which could be created by including different types of motivation into one autonomous motivation variable. Therefore, we split the autonomous motivation up into an extrinsic and an intrinsic part. This resulted in three items to measure extrinsic autonomous motivation (items Autmot 1, Autmot 2, Autmot 3 from Table 4 with a Cronbach's alpha of .688) and three items to measure intrinsic autonomous motivation (items Autmot 4, Autmot 5, Autmot 6 from Table 4 with a Cronbach's alpha of .809). To get more insights into how an enabling PMS affects the different types of motivation, constructs to measure the three basic psychological needs (autonomy, competence, and relatedness) are integrated in the model.[8] In addition, as controlled motivation had only a marginally non-significant effect on effort, we decided to include effort in this relationship as well. Despite the rather large expansion of the model, the expanded model shows a good measurement model fit[9] with a RMSEA of .057, a SRMR of .070, and a CFI of .95. The χ^2 over df also shows a good fit (2,272.42 / 1,503 = 1.51). The outcome of the structural model (SF) indicates an acceptable fit (RMSEA = .058; CFI = .94; SRMR = .097).[10] The results of the analysis are depicted in Figure 3. This model strengthens the findings that an enabling PMS enhances all three basic psychological needs. Moreover, both the extrinsic autonomous motivation and the intrinsic autonomous motivation contribute to the augmentation of effort, subsequently performance. The

[8] To measure the three basic psychological needs, the basic need satisfaction scale (Van den Broeck et al., 2010) is used. In this scale autonomy, competence and relatedness are measured using six items to measure each of the needs. Due to rather high cross loadings between some of the autonomy and competence items, two autonomy items and two competence items were deleted from the analysis. This delivered a Cronbach's alpha of .751 for relatedness, .702 for autonomy, and .864 for competence.

[9] After that the two autonomy items and competence items were deleted from the analysis.

[10] The mediocre fit of SRMR is most likely due to the small sample size. However, previous research indicated that a SRMR between .08 and .10 can be excepted as good.

increase in intrinsic autonomous motivation is caused by an increase in each of the three basic needs. This confirms previous literature that indicates that through satisfaction of the three basic psychological needs an increase in intrinsic motivation appears (Ryan & Deci, 2000). Nevertheless, only competence and relatedness show a positive relationship with extrinsic autonomous motivation. The relationship between autonomy and extrinsic autonomous motivation appears to be insignificant. In contrast, autonomy is the only need that affects controlled motivation. The model shows a negative relationship. Noteworthy is that the marginally non-significant relationship between controlled motivation and effort became marginally significant in this analysis. This indicates that the results should be interpreted with care and further research is necessary to gain better insights in this relationship.

"Insert Figure 3 here"

Previous research indicated that a different use of PMSs at different managerial levels can lead to different effects on outcome (Malina & Selto, 2001; Wouters & Wilderom, 2008). In our study first-level managers', middle managers', and top level managers' results have been analysed together. As a result, integrating all levels of management can confound results. However, as the purpose of this paper is to investigate whether a PMS perceived as enabling formalization leads to improvement of the manager's level of performance, and all managers are asked to indicate the degree to which they perceive the PMS as enabling, the possibility of confounding results is largely ruled out. The use of a PMS has been confined to the perception of an enabling use. In addition, a preliminary analysis of lower management (N = 60)[11] and top management (N = 124) has been executed in this study. Most of the statistics felt below the threshold (top management: RMSEA = .065; SRMR = .082; CFI = .93; lower management: RMSEA = .108; SRMR = .111; CFI = .75). The decrease in observations (due to the split up in two groups) might have caused the drop in the fit statistics. As a consequence, the results should be interpreted with care. The analyses revealed that the findings for these subcategories are similar to the overall findings (Table 9). Only in the top management group the relationship between autonomous motivation and performance was no longer significant (t = 1.51). We believe that the decrease in sample size might be the cause of this non-significant relationship.

"Insert Table 9 here"

[11] Due to small sample size and similar characteristics of first-level managers with middle managers, these two management levels have been analysed together.

5. CONCLUSIONS

The empirical analysis shows that a PMS that is perceived as an enabling formalization will positively influence managerial performance. Our study also shows the role of motivation in explaining the relationship between an enabling PMS and performance. In addition, the results indicate that motivation should not be treated as a one-dimensional construct and that in modelling performance effects of enabling PMSs it is optimal to distinguish between autonomous and controlled motivation, as suggested by the self-determination theory. More specifically, we show that the autonomous motivation of the managers is an important variable mediating the PMS-performance relationship, and that controlled motivation has no significant explaining power or might have a small negative effect on managerial performance. A PMS that is perceived as an enabling formalization significantly enhances managers' autonomous motivation. This enhanced autonomous motivation positively influences managerial performance.

The results of the study contribute to the literature in several ways. The findings add to the literature investigating the motivational mechanisms to elucidate how a PMS can improve performance (Burney & Widener, 2007; Burney et al., 2009; Hall, 2008, 2011). Moreover, this research contributes to recent literature indicating a different categorization of the concept motivation could serve deeper insights on managerial outcomes (Adler & Chen, 2011; Ankli & Palliam, 2012). The study also responds to calls to investigate the characteristics that determine the effectiveness of a PMS to enhance performance. In this view, the framework of Adler and Borys (1996) on enabling formalization has been used. A conceptualization and operationalization of this framework in a PMS context has been executed. A scale to measure the degree to which a PMS is perceived as an enabling formalization has been developed. This scale is used to explore the proposed effect of a PMS perceived as enabling on performance. The scale comprises 12 items that are manifestations of the four features (repair, internal transparency, global transparency, and flexibility) of an enabling PMS. The features are pointed out as indicators of the enabling nature of a PMS (Adler & Borys, 1996; Ahrens & Chapman, 2004).

Our results have important implications for the management accounting practice. In driving corporate performance managers and controllers have to understand that PMSs can motivate managers in an autonomous way. When the corporate managers and controllers primarily want to develop autonomous motivation, PMS designers should make sure that the PMS is perceived as an enabling formalization.

This implies that managers should be able to influence the PMS-design, and fully understand the need of the performance measures. In addition, the resulting performance measures must make sense to the managers. Performance reports should provide actionable performance information that help managers to identify improvements, better execute their tasks and deal with contingencies. When these conditions are met managers feel valued, and they are more likely to be highly autonomously motivated.

The current study is subject to several limitations. First, preliminary results on the analyses that control for management level reveal similar findings. However, as the fit indices felt below the thresholds, one should be careful when interpreting the results. Therefore, future research could repeat this research with bigger samples of lower management and / or top management to verify the preliminary results of the separate analyses. Second, effort and performance in our study are self-reported variables. Although managers are considered the best judges of their own performance (Hall, 2011; Mills, 2011), future research could benefit from a more objective measurement of these variables. Consequently, further research could benefit from supervisors' or colleagues' ratings for effort and performance.
Third, some of the analyses indicated a non-significant relationship between controlled motivation and effort / performance, while other analyses in this study indicate a marginally significant relationship, which indicate the existence of a negative effect between controlled motivation and effort. Consequently, more research is necessary to investigate this relationship. A more profound view into the power and direction of the relationship is necessary. In addition, future research can investigate whether confounding variables could further explain the relationship between controlled motivation and managerial outcomes, such as effort and performance.

Besides the opportunities for future research that rise from the shortcomings, opportunities for further research also rise from the strengths of this study. As a result, further research could use the concepts autonomous and controlled motivation in other accounting research to solve equivocal results in debates were motivation could serve as explaining variable.
Another possibility for future research rises from the findings of this paper. From this study, we know that a PMS that is designed and implemented in an enabling way has a positive influence on autonomous motivation and managerial performance, but the question is now: what happens when after the enabling implementation process financial compensation of managers is linked to the performance measures? What will be the effect on autonomous motivation and performance? Further

research could investigate whether linking financial compensation to performance measures moderates the performance effects of enabling PMSs.

6. REFERENCES

Adler, P. S., & Borys, B. (1996). Two types of bureaucracy: Enabling and coercive. *Administrative Science Quarterly*, 41(1), 61-89.

Adler, P. S., & Chen, C. X. (2011). Combining creativity and control: Understanding individual motivation in large-scale collaborative creativity. *Accounting, organizations and society*, 36(2), 63-85.

Ahrens, T., & Chapman, C. S. (2004). Accounting for flexibility and efficiency: A field study of management control systems in a restaurant chain. *Contemporary Accounting Research*, 21(2), 271-301.

Amabile, T. M. (1994). The work preference inventory: Assessing intrinsic and extrinsic motivational orientations. *Work*, 94(S3), 950-967.

Ankli, R. E., & Palliam, R. (2012). Enabling a motivated workforce: exploring the sources of motivation. *Development and Learning in Organizations*, 26(2), 7-10.

Artz, M., Homburg, C., & Rajab, T. (2012). Performance-measurement system design and functional strategic decision influence: The role of performance-measure properties. *Accounting, organizations and society*, 37(7), 445-460.

Baard, P. P., Deci, E. L., & Ryan, R. M. (2004). Intrinsic need satisfaction: A motivational basis of performance and well-being in two work settings. *Journal of Applied Social Psychology*, 34(10), 2045-2068.

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117(497-529.

Benner, M. J., & Tushman, M. (2002). Process management and technological innovation: A longitudinal study of the photography and paint industries. *Administrative Science Quarterly*, 47(4), 676-706.

Bisbe, J., Batista-Foguet, J. M., & Chenhall, R. (2007). Defining management accounting constructs: A methodological note on the risks of conceptual misspecification. *Accounting Organizations and Society*, 32(7-8), 789-820.

Bollen, K. A. (1989). *Structural equations with latent variables*. New York: Wiley.

Bonner, S. E., & Sprinkle, G. B. (2002). The effects of monetary incentives on effort and task performance: theories, evidence, and a framework for research. *Accounting Organizations and Society*, 27(4-5), 303-345.

Bourne, M., Melnyk, S., & Faull, N. (2007). The impact of performance measurement on performance. *International Journal of Operations & Production Management*, 27(8), 781-783.

Burkert, M., Fischer, F. M., & Schaffer, U. (2011). Application of the controllability principle and managerial performance: The role of role perceptions. *Management accounting research*, 22(3), 143-159.

Burney, L., & Widener, S. K. (2007). Strategic Performance Measurement Systems, Job-Relevant Information, and Managerial Behavioral Responses--Role Stress and Performance. *Behavioral Research in Accounting*, 19(43-69.

Burney, L. L., Henle, C. A., & Widener, S. K. (2009). A path model examining the relations among strategic performance measurement system characteristics, organizational justice, and extra- and in-role performance. *Accounting Organizations and Society*, 34(3-4), 305-321.

Cardinal, L. B. (2001). Technological innovation in the pharmaceutical industry: The use of organizational control in managing research and development. *Organization Science*, 12(1), 19-36.

Chapman, C. S., & Kihn, L. A. (2009). Information system integration, enabling control and performance. *Accounting, Organizations and Society*, 34(2), 151-169.

Chenhall, R. H., & Smith, D. (2011). A review of Australian management accounting research: 1980-2009. *Accounting and Finance*, 51(1), 173-206.

Chong, V. K., & Chong. (2002). Budget goal commitment and informational effects of budget participation on performance: A structural equation modeling approach. *Behavioral Research in Accounting*, 14(65.

Chong, V. K., & Johnson, D. M. (2007). Testing a model of the antecedents and consequences of budgetary participation on job performance. *Accounting and Business Research*, 37(1), 3-19.

Cools, M., Emmanuel, C., & Jorissen, A. (2008). Management control in the transfer pricing tax compliant multinational enterprise. *Accounting, Organizations and Society*, 33(6), 603-628.

Davila, A., Foster, G., & Li, M. (2009). Reasons for management control systems adoption: Insights from product development systems choice by early-stage entrepreneurial companies. *Accounting Organizations and Society*, 34(3-4), 322-347.

De Cooman, R., De Gieter, S., Pepermans, R., Jegers, M., & Van Acker, F. (2009). Development and validation of the Work Effort Scale. *European journal of psychological assessment*, 25(4), 266.

de Leeuw, S., & van den Berg, J. P. (2011). Improving operational performance by influencing shopfloor behavior via performance management practices. *Journal of operations management*, 29(3), 224-235.

Deci, E. L., & Ryan, R. M. (2000). The" what" and" why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological inquiry*, 11(4), 227-268.

Dekker, H. C. (2008). Partner selection and governance design in interfirm relationships. *Accounting, Organizations and Society*, 33(915-941.

Dekker, H. C., & Van den Abbeele, A. (2010). Organizational Learning and Interfirm Control: The Effects of Partner Search and Prior Exchange Experiences. *Organization Science*, 21(6), 1233–1250.

Dillman, A. (2000). *Mail and internet surveys - The tailored design method*. New York, NY: John Wiley & Sons.

Franco-Santos, M., & Bourne, M. (2005). An examination of the literature relating to issues affecting how companies manage through measures. *Production, Planning & Control*, 16(2), 114-124.

Franco-Santos, M., Lucianetti, L., & Bourne, M. (2012). Contemporary performance measurement systems: A review of their consequences and a framework for research. *Management accounting research*, 23(2), 79-119.

Free, C. (2007). Supply-chain accounting practices in the UK retail sector: Enabling or coercing collaboration? *Contemporary Accounting Research*, 24(3), 897-933.

Fullerton, R., Kennedy, F., & Widener, S. (2013). Management accounting and control practices in a lean manufacturing environment. *Accounting, organizations and society*, 38(1), 50-71.

Gagne, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior*, 26(4), 331-362.

Gagné, M., & Forest, J. (2008). The study of compensation systems through the lens of self-determination theory: Reconciling 35 years of debate. *Canadian Psychology*, 49(3), 225-232.

Gagne, M., Forest, J., Gilbert, M. H., Aube, C., Morin, E., & Malorni, A. (2010). The Motivation at Work Scale: Validation Evidence in Two Languages. *Educational and Psychological Measurement*, 70(4), 628-646.

Gagné, M., Forest, J., Vansteenkiste, M., Crevier-Braud, L., Broeck, A. V. d., Aspeli, A. K., . . . Westbye, C. (2014). The Multidimensional Work Motivation Scale: Validation evidence in seven languages and nine countries. *European Journal of Work and Organizational Psychology*, 1-19.

Gagné, M., Forest, J., Vansteenkiste, M., Crevier-braud, L., Van den Broeck, A., Aspeli, A. K., . . . Wang, Z. (2012). *Title*. working paper. John Molson School of Business, Concordia University. Montréal.

González-Romá, V., Fortes Ferreira, L., & Peiró, J. (2009). Team climate, climate strength and team performance. A longitudinal study. *Journal of Occupational and Organizational Psychology*, 82(3), 511-536.

Hair, J., Black, W., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis*. (Sixth edition). New Jersey: Pearson Prentice Hall.

Hall, M. (2008). The effect of comprehensive performance measurement systems on role clarity, psychological empowerment and managerial performance. *Accounting, organizations and society*, 33(2-3), 141-163.

Hall, M. (2011). Do comprehensive performance measurement systems help or hinder managers' mental model development? *Management accounting research*, 22(2), 68-83.

Hartmann, F. G. H., & Maas, V. S. (2011). The effects of uncertainty on the roles of controllers and budgets: An exploratory study. *Accounting and Business Research*, 41(5), 439-458.

Helin, S., Jensen, T., Sandstrom, J., & Clegg, S. (2011). On the dark side of codes: Domination not enlightenment. *Scandinavian Journal of Management*, 27(1), 24-33.

Hempel, P. S., Zhang, Z. X., & Han, Y. L. (2012). Team empowerment and the organizational context: Decentralization and the contrasting effects of formalization. *Journal of Management*, 38(2), 475-501.

Henri, J.-F. (2006). Management control systems and strategy: A resource-based perspective. *Accounting, organizations and society*, 31(6), 529-558.

Hoy, W. K., & Sweetland, S. R. (2001). Designing better schools: The meaning and measure of enabling school structures. *Educational Administration Quarterly*, 37(3), 296-321.

Hu, L. T., & Bentler, P. M. (1999). Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria Versus New Alternatives. *Structural Equation Modeling-a Multidisciplinary Journal*, 6(1), 1-55.

Iacobucci, D. (2010). Structural equations modeling: Fit Indices, sample size, and advanced topics. *Journal of Consumer Psychology*, 20(90-98.

Kawakami, T., MacLachlan, D. L., & Stringfellow, A. (2012). New Venture Performance in China, Japan, and the United States: The Impact of Formalized Market Information Processes. *Journal of Product Innovation Management*, 29(2), 275-287.

Kolehmainen, K. (2009). Dynamic Strategic Performance Measurement Systems: Balancing Empowerment and Alignment. *Long range planning*, 43(4), 527-554.

Langfred, C. W., & Moye, N. A. (2004). Effects of task autonomy on performance: An extended model considering motivational, informational, and structural mechanisms. *Journal of applied psychology*, 89(6), 934-945.

Lee, C. L., & Yang, H. J. (2011). Organization structure, competition and performance measurement systems and their joint effects on performance. *Management accounting research*, 22(2), 84-104.

Li, Y. A., Lee, S. H., Li, X. Y., & Liu, Y. (2010). Knowledge Codification, Exploitation, and Innovation: The Moderating Influence of Organizational Controls in Chinese Firms. *Management and Organization Review*, 6(2), 219-241.

Liker, J. K., Collins, P. D., & Hull, F. M. (1999). Flexibility and standardization: Test of a contingency model of product design-manufacturing integration. *Journal of Product Innovation Management*, 16(3), 248-267.

Mahoney, T. A. (1965). The job (s) of management. *Industrial relations*, 4(2), 97.

Malina, M. A., & Selto, F. H. (2001). Communicating and controlling strategy: an empirical study of the effectiveness of the balanced scorecard. *Journal of Management Accounting Research* 13(47-90.

Marginson, D. (2005). Coping with ambiguity through the budget: the positive effects of budgetary targets on managers' budgeting behaviours. *Accounting, organizations and society*, 30(5), 435.

Mills, M. J. (2011). Associations among achievement measures and their collective prediction of work involvement. *Personality and Individual Differences*, 50(3), 360-364.

Naranjo-Gil, D., & Hartmann, F. (2006). How Top Management Teams Use Management Accounting Systems to Implement Strategy. *Journal of Management Accounting Research*, 18(21-53.

Neely, A., Mills, J., Platts, K., Gregory, M., & Richards, H. (1994). Realizing strategy through measurement. *International Journal of Operations & Production Management*, 14(3), 140-153.

Otley, D. (1999). Performance management: A framework for management control systems research. *Management Accounting Research*, 10(4), 363-382.

Parker, S. K. (2003). Longitudinal effects of lean production on employee outcomes and the mediating role of work characteristics. *Journal of Applied Psychology*, 88(4), 620-634.

Patel, P. (2011). Role of manufacturing flexibility in managing duality of formalization and environmental uncertainty in emerging firms. *Journal of Operations Management*, 29(1-2), 143-162.

Pavlov, A., & Bourne, M. (2011). Explaining the effects of performance measurement on performance An organizational routines perspective. *International Journal of Operations & Production Management*, 31(1-2), 101-122.

Proenca, T. (2010). Self-managed work teams: An enabling or coercive nature. *International Journal of Human Resource Management*, 21(3), 337-354.

Roth, G., Assor, A., Kanat-Maymon, Y., & Kaplan, H. (2007). Autonomous motivation for teaching: How self-determined teaching may lead to self-determined learning. *Journal of Educational Psychology*, 99(4), 761-774.

Ryan, R. M., & Connell, J. P. (1989). Perceived locus of causality and internalization: Examining reasons for acting in two domains. *Journal of Personality and Social Psychology*, 57(5), 749-761.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *The American psychologist*, 55(1), 68-78.

Shadur, M. A., Kienzle, R., & Rodwell, J. J. (1999). The relationship between organizational climate and employee perceptions of involvement - The importance of support. *Group & Organization Management*, 24(4), 479-503.

Sholihin, M., & Pike, R. (2009). Fairness in performance evaluation and its behavioural consequences. *Accounting and Business Research*, 39(4), 397-413.

Speckbacher, G., Bischof, J., & Pfeiffer, T. (2003). A descriptive analysis on the implementation of balanced scorecards in German-speaking countries. *Management Accounting Research*, 14(4), 361-387.

Stansbury, J., & Barry, B. (2007). Ethics programs and the paradox of control. *Business Ethics Quarterly*, 17(2), 239-261.

Sundin, H., Granlund, M., & Brown, D. A. (2010). Balancing multiple competing objectives with a balanced scorecard. *European Accounting Review*, 19(2), 203-246.

Van den Broeck, A., Vansteenkiste, M., & De Witte, H. (2008). Self-determination theory - A theoretical and empirical overview in occupational health psychology.

Van den Broeck, A., Vansteenkiste, M., De Witte, H., Soenens, B., & Lens, W. (2010). Capturing autonomy, competence, and relatedness at work: Construction and initial validation of the Work-related Basic Need Satisfaction scale. *Journal of Occupational and Organizational Psychology*, 83(4), 981.

Van der Hauwaert, E., & Bruggeman, W. (2013). The balanced scorecard as an enabling technology: The role of participation. *International Journal of Management Accounting Research*, 3(2), 1-.

van der Meer-Kooistra, J., & Scapens, R. W. (2008). The governance of lateral relations between and within organisations. *Management accounting research*, 19(4), 365-384.

Vansteenkiste, M., Niemiec, C. P., & Soenens, B. (2010). The development of the five mini-theories of self-determination theory: an historical overview, emerging trends, and future directions. In T.C. Urdan, & S.A. Karabenick (Eds.), *The Decade Ahead: Theoretical Perspectives on Motivation and Achievement* (pp. 105-165). UK: Emerald Group Publishing Limited.

Vansteenkiste, M., Ryan, R. M., & Deci, E. L. (2008). Self-determination theory and the explanatory role of psychological needs in human well-being. .

Vlaar, P. W. L., Van den Bosch, F. A. J., & Volberda, H. W. (2006). Coping with problems of understanding in interorganizational relationships: Using formalization as a means to make sense. *Organization Studies*, 27(11), 1617-1638.

Weibel, A. (2007). Formal control and trustworthiness - Shall the twain never meet? *Group & Organization Management*, 32(4), 500-517.

Widener, S. K. (2007). An empirical analysis of the levers of control framework. *Accounting, organizations and society*, 32(7-8), 757-788.

Wiersma, E. (2009). For which purposes do managers use Balanced Scorecards? An empirical study. *Management accounting research*, 20(4), 239-251.

Wong-On-Wing, B., Guo, L., & Lui, G. (2010). Intrinsic and Extrinsic Motivation and Participation in Budgeting: Antecedents and Consequences. *Behavioral Research in Accounting*, 22(2), 133-153.

Wouters, M. (2009). A developmental approach to performance measures - Results from a longitudinal case study. *European Management Journal*, 27(1), 64-78.

Wouters, M., & Roijmans, D. (2011). Using prototypes to induce experimentation and knowledge integration in the development of enabling accounting information. *Contemporary Accounting Research*, 28(2), 708-736.

Wouters, M., & Wilderom, C. (2008). Developing performance-measurement systems as enabling formalization: A longitudinal field study of a logistics department. *Accounting, Organizations and Society*, 33(4-5), 488-516.

APPENDIX A

Previous research has indicated that enabling formalization ought to influence outcomes positively (Adler & Borys, 1996; Ahrens & Chapman, 2004; Wouters & Wilderom, 2008), however, empirically this has not been tested on a large scale. Moreover, according to the authors' knowledge no operationalization of an enabling PMS has been performed. This makes research on this topic on a large scale difficult. Therefore, the authors decided to develop a scale capable of measuring the degree to which a PMS is perceived as enabling. As no previous scale has been developed the risks of conceptual misspecification are high. To create a sound conceptual specification authors took into account the recommendations proposed by Bisbe et al. (2007). Consequently, much attention has been devoted the theory and theoretical issues when defining definitions and items to measure the construct. Different steps were taken during the development of the items to measure the enabling PMS construct. First, one of the authors started to translate the original features (repair, internal transparency, global transparency, and flexibility as defined by Adler and Borys (1996)) that determine whether a work process is enabling to a PMS context (see Table 3). Moreover, the new definition was tested against other literature around this topic, the authors had collected. The authors then discussed the clarity and accuracy of the conceptualization of the features until a consensus was reached. Second, for each feature six items had been developed that ought to measure the construct. The 24 items were developed (see table appendix A1). Third, two experts in the management control domain were asked to consider these 24 items and indicate whether (1) they thought the item could measure one of the four features. And if so, (2) to which feature it was most likely to be related to. The experts independently looked at these questions. The authors afterwards centralized their findings. The items on which the experts could not reach consensus were deleted. Attention was also given to items for which the experts indicated they were too much alike. Furthermore, if the experts both indicated the item measured another feature, the authors contacted them for their reasoning for this categorization. Afterwards the authors discussed about this recategorization and decided to follow the recategorization or leave it to be. As a result, 12 items were deleted (repair4, repair5, repair6, inttrans4, inttrans6, glotrans1, glotrans3, glotrans5, glotrans6, flex2, flex3, flex4). Only one item shifted from feature. Experts indicated inttrans5 was more likely to measure global transparency, than internal transparency. Consequently 12 items remained to measure the degree to which the PMS is perceived enabling. Each feature was measured by three items. Repair is measured by repair1, repair2, and repair3. Internal transparency is measured by inttrans1, inttrans2, and inttrans3. Taken into account the recategorization, global transparency is measured by the items inttrans5, glotrans2, and glotrans4.

Table Appendix A1: Enabling performance measurement system items

Repair 1	The performance measures help me to start actions for improvement myself.
Repair 2	The performance measurement system makes it possible to react in time, consequently be able to avoid problems.
Repair 3	The performance measurement system makes it possible to put forward some measures which can serve as alarm bells.
Repair 4	If there are any problems concerning performance measures, only top management is able to adapt these.
Repair 5	I can fix control processes myself where necessary.
Repair 6	Employees can fix work processes themselves if necessary.
Inttrans 1	I understand the performance measures in my domain.
Intrans 2	I understand why certain performance measures are included in my domain.
Inttrans 3	There is information available about the current condition of the performance measures in my domain.
Inttrans 4	Best practice experiences are exchanged.
Inttrans 5	The performance measurement system gives me an indication in how I execute my job.
Inttrans 6	The reasons to put things in the performance measurement system are clear in my domain.
Glotrans 1	The reasons behind performance measurement system of the organization as a whole is clear.
Glotrans 2	The link between my own tasks and the goals of the organization are clear.
Glotrans 3	The performance measurement system helps me to be creative to communicate with the entire organization.
Glotrans 4	The performance measurement systems makes it possible to communicate with the stakeholders of the organization.
Glotrans 5	The performance measurement systems has been explained in detail to all employees.
Glotrans 6	The performance measurement system has been explained in detail to me.
Flex 1	I can take decisions on the basis of the performance information delivered by the performance measurement system.
Flex 2	I can take steps myself to improve the performance measurement system.
Flex 3	My decisions are taken into account when the performance measurement system has to change.
Flex 4	The interface of the performance measurement system can be changed if necessary.
Flex 5	Performance measures can be added to the performance measurement system to meet specific work needs.
Flex 6	Suggestions on which I can make decisions, arise from the performance measurement system.

APPENDIX B

The authors of the motivation at work scale (MAWS) delivered us the items which were under investigation for this new scale, the MAWS-2 (Gagné et al., 2012). To avoid validity and reliability problems we decided to pre-test the Dutch MAWS-2. This scale consisted of 59 items that ought to measure motivation on three dimensions, with some sub-categories. The first nine items in the scale measure the degree to which the employee shows amotivation in his job. Amotivation involves a lack of intention and motivation (Gagne & Deci, 2005). To measure controlled motivation 32 items were implemented. Items to measure extrinsic regulation (monetary and social drivers and pressures) and introjected regulation were integrated. Items on both approach (e.g. receive a bonus, get approval, feel proud and worthy) and avoidance (e.g. avoid being fired, avoid losing financial benefits, avoid disappointment, avoid guilt) were introduced. The scale also has items to measure autonomous motivation. Three sub-categories can be discerned, namely identified regulation, integrated regulation, and intrinsic regulation.

All 59-items were pretested in a Dutch speaking Belgium company which employs 1,375 persons. 770 employees, which equals to 56% of the population, filled out the questionnaire. The purpose of this pre-test was to reduce the number of items needed to measure the different types of motivation drastically, as the 59-items could induce response bias or increase the questionnaire's dropout rate. To reduce the number of items a multi-step approach has been followed. First, we decide to remove all items that were implemented to measure the level of amotivation. The results in the pre-test displayed employees had very low level of amotivation. This indicates that people with no work motivation probably leave the firm. Consequently, these items cannot add much information. This made it possible to delete the items that measure amotivation, which reduced the number of items from 59 to 50. From the 50 remaining items, 27 could easily be deleted without damaging the reliability and the validity of the items. With those other 23 items, it remained more or less possible to measure all types of motivation (external, introjected, identified, integrated, and intrinsic motivation). Nevertheless, some cross loadings (>.40) appeared. Due to these cross-loadings, and the fact that we only need to distinguish controlled from autonomous motivation, we further reduced the number of items used to measure controlled and autonomous motivation in this study. Of the 23 remaining items, 11 were deleted. After deleting those items it remained possible to keep a balance in the number of items of the different types of motivation (external, introjected, identified, integrated, and intrinsic motivation). Of the 12 remaining items, six are used to measure controlled motivation. The other six measure autonomous motivation. Within the six

remaining items in each category, the balance between the different subcategories has been maintained (2nd column Table 2).

APPENDIX C

To determine which of the models shows the best fit, the χ^2 difference test ($\Delta\chi^2/\Delta df$) and the Akaike Information Criterion (AIC) are used. Model SA represents the fully mediated model, which has been proposed theoretically (Figure Appendix C1 panel A). It is important to test whether motivation (controlled and autonomous) has explaining power in the relationship between an enabling PMS and managerial performance. This has been investigated in model SB. In this model only the direct effect of an enabling PMS on performance is investigated. The fit of this model is worse compared to the proposed model. The AIC of this model is 5,472.25 (compared to 5,465.39). There is no difference in df. As a result, χ^2 indicates model SB has a worse fit compared to model SA (776.01 > 769.15). Finally, model SC is the partial mediated model, in which both the direct effect of an enabling PMS on performance and the indirect effect through motivation are introduced. In short, model SC is model SA with one additional relationship, namely the direct effect between an enabling PMS on performance. The χ^2 difference test (α=.05) does not show a significant difference between model SC and model SA (χ^2 difference = 1.61 < 3.84). The AIC indicates model SC fits the data slightly worse than the theoretical proposed model SA (5,465.78 versus 5,465.39). To determine which of the models should be selected, we took several indicators into consideration. According to the χ^2 and the χ^2 difference test, the fit of model SB is worse compared to the fit of model SA toward the data. No significant difference between the fit of the models SA and SC could be detected when using the χ^2 difference test. Although the SRMR shows a slightly better fit of model SC than model SA (SC = .068 vs. SA = .069); the AIC indicated model SC performs slightly worse than model SA. In addition, the impact of the direct relationship between enabling PMS and performance of model SC is not significant (t = 1.26) (Figure Appendix C1 panel B). This implies that the mediator absorbs all explaining power of the direct relationship. As a result, model SA is selected as the model with the best fit, and will be used when analysing the results.

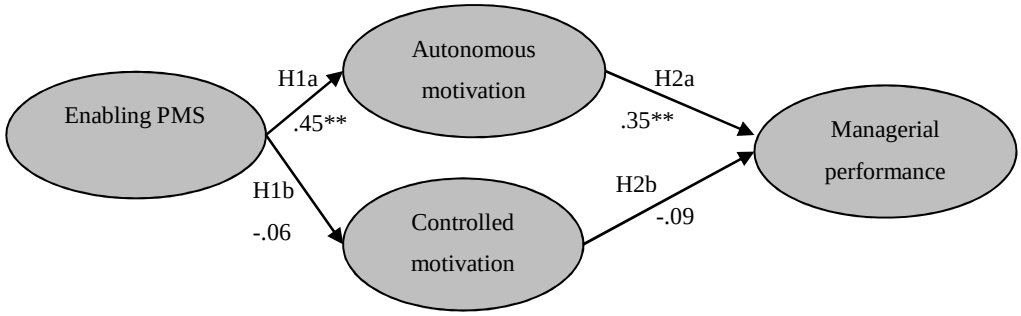
Table Appendix C1: Model comparison statistics (structural model)

	Model SA	**Model SB**	**Model SC**
χ^2	769.15	776.01	767.54
Df	491	491	490
χ^2/df	1.57	1.58	1.57
RMSEA	.055	.056	.057
SRMR	.069	.073	.068
CFI	.95	.95	.95
AIC	5,465.39	5,472.25	5,465.78
χ^2 difference test (Model A)			1.61 < 3.84

Notes: n = 186

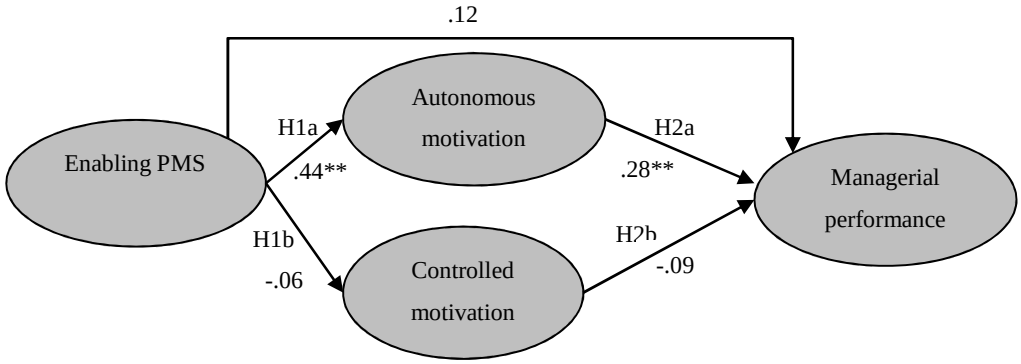
Figure Appendix C1: Path coefficients and t-values structural model (SA)

Panel A: structural model SA



**, * indicates a p-value of <.01, .05 in a one tailed t-test

Panel B: structural model SC



**, * indicates a p-value of <.01, .05 in a one tailed t-test

APPENDIX D

To measure effort, the work effort scale (WESC) is used. This scale developed by De Cooman et al. (2009) contains ten items that measure effort along three dimensions (intensity, direction, and persistence). To ask the participants their opinion of each of the items, a 7-point Likert scale is used. The three factors explain 72.67% of the variance. The total scale had a Cronbach's alpha coefficient of .90 in the original study. With a Cronbach's alpha of .858 in our study we find additional indication of the reliability of the construct. When adding the effort items to the items that measure the constructs autonomous motivation, controlled motivation, performance, and enabling performance measurement system no significant changes in factor loadings and cross loadings appeared. The factor loadings of effort in this analysis are displayed in table D1. A positive significant correlation between effort and autonomous motivation and performance has been found. Moreover, no correlation between controlled motivation and effort appeared (see table D2). These findings also point toward the positive association of autonomous motivation and performance, with effort as mediating variable; and the non-significant relationship of controlled motivation and managerial outcomes, as no correlation between effort and controlled motivation has been found. Although the correlation points toward above mentioned relationships, these associations need to be tested formally. Consequently, a measurement model and a structural model, containing effort measured with the ten above mentioned items, has been developed. Fit statistics of these models, which are displayed in table D3, reveal the measurement and structural model containing effort (model SD) are good (CFI =.95, RMSEA =.055, SRMR =.075) and does not show a significantly different fit from model SA (χ^2 difference test = 1.54). Moreover, findings of model SA are supported as autonomous motivation has a positive effect on effort (t = 4.48), and subsequently on performance (t = 4.42), while controlled motivation has no effect on effort (t = -1.83). The latter supports our findings as it indicates that controlled motivation does not influence managerial outcomes, as neither effort, nor performance are associated with controlled motivation. The path coefficients and t-statistics of model SD are displayed in table D4, and the relationships are visualised in figure D1.

Table Appendix D1: factor loadings effort

Effort		Items	Factor loadings
Efft1	Persistence	I do not give up quickly when something does not work well.	.444
Efft2	Persistence	I really do my best to get my work done, regardless of potential difficulties.	.768
Efft3	Persistence	When I start an assignment I pursue it to the end.	.604
Efft4	Intensity	I do my best to do what is expected of me.	.604
Efft5	Intensity	I am trustworthy in the execution of the tasks that are assigned	.597
Efft6	Intensity	I really do my best to achieve the objectives of the organization.	.679
Efft7	Direction	I think of myself as a hard worker.	.598
Efft8	Direction	I really do my best in my job.	.755
Efft9	Direction	I put a lot of energy into the tasks that I commence.	.680
Efft10	Direction	I always exert equally hard during the execution of my job.	.599

Table Appendix D2: Pearson correlation table effort included

	1	2	3	4	5
1. Controlled motivation	1				
2. Autonomous motivation	-.026	1			
3. Effort	-.150*	.479**	1		
4. Performance	-.120	.229**	.451**	1	
5. Enabling PMS	-.031	.383**	.373**	.195**	1

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table Appendix D3: Model comparison statistics (structural model) with effort

	Model SD
χ^2	1,332.94
Df	855
χ^2/df	1.559
RMSEA	.056
SRMR	.076
CFI	.95
AIC	5,472.25
χ^2 difference test (Model A)	1.54 < 3.84

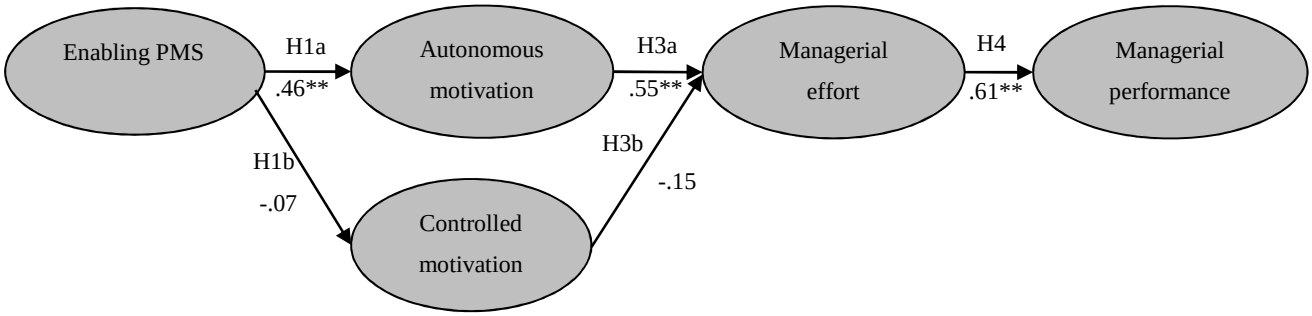
Table Appendix D4: Path coefficients, t-statistics, and R^2 statistics structural model with effort (model SD)

Dependent variables	**Independent variables**				
	Enabling PMS	Controlled motivation	Autonomous motivation	Effort	R^2
Controlled motivation	-.07 (-.80)				.005
Autonomous motivation	.46 (5.33)**				.214
Effort		-.15 (-1.83)	.55 (4.48)**		.328
Performance				.61 (4.42)**	.367

Each cell reports the path coefficient (t-value).

**,* Indicates a p-value of <.01; .05 in a one-tailed test.

Figure Appendix D1: Results structural model with effort (path coefficients model SD)



**, * indicates a p-value of <.01, .05 in a one tailed t-test

TABLES

Table 1: Respondents' characteristics

		N		%	Mean	SD	Min	Max
Firm characteristics								
Company size (worldwide)		**186**			5.23	2.214	1	9
(1)	< 50		1	0.5				
(2)	51 to100		3	1.6				
(3)	101 to 250		54	29.0				
(4)	251 to 500		37	19.9				
(5)	501 to 1,000		24	12.9				
(6)	1,001 to 2,000		20	10.8				
(7)	2,001 to 5,000		12	6.5				
(8)	5,001 to 10,000		8	4.3				
(9)	> 10,001		31	16.7				
Company sector and industry		**186**						
	Private sector							
	Agriculture		1	0.5				
	Manufacturing		101	54.3				
	Services		51	27.4				
	Others		5	2.7				
	Public sector		25	13.4				
	Semi-governmental		3	1.6				
Individual characteristics								
Age		**185**			46.5	8.171	27	63
Gender		**185**						
	Male		161	86.6				
	Female		24	12.9				
Management level		**186**						
	first-level management			5.9				
	middle management			27.4				
	top management			66.7				

Table 2: Comparison definition four generic features of enabling formalization

Feature	Definition *workflow formalization* Adler and Borys (1996)	Definition *PMS formalization* (based on recent research within MCS context)
Repair	generates procedures that facilitate responses to real work contingencies. Breakdowns and repairs identify problems with formal procedures and become opportunities for improvement.	holds that the PMS is designed to help subordinates determine whether the performance is under control, and help them to identify and implement improvement actions to solve occurring problems.
Internal transparency	means that users need both an understanding of the logic of the equipment's internal functioning and information on the equipment's status.	requires that managers have a clear understanding of the PMS itself and its underlying rational.
Global transparency	refers to technologies that are programmed to provide operators with extensive information relating to the status of the broader production process.	provides users with a wide range of contextual information that facilitates a better understanding in the broader context of the organization.
Flexibility	holds that machines are programmed to give advice and make suggestions, but it is the responsibility of the user to make controlling decisions after the system displays the requisite data.	holds that the PMS is designed to signal variations and deviations to provide the managers with insights and learning opportunities to help them identify and decide on controlling decisions and to encourage them to modify the PMS to suit their specific work demands.

Table 3: Enabling performance measurement system scale items

ITEMS	
Repair (Cronbach's alpha = .800)	
Enabling 1	The performance measures help me to start actions for improvement myself.
Enabling 2	The performance measurement system makes it possible to react in time, consequently be able to avoid problems.
Enabling 3	The performance measurement system makes it possible to put forward some measures which can serve as alarm bells.
Internal transparency (Cronbach's alpha = .782)	
Enabling 4	I understand the performance measures in my domain.
Enabling 5	I understand why certain performance measures are included in my domain.
Enabling 6	There is information available about the current condition of the performance measures in my domain.
Global transparency (Cronbach's alpha = .667)	
Enabling 7	The performance measurement system gives me an indication in how I execute my job.
Enabling 8	The link between my own tasks and the goals of the organization are clear.
Enabling 9	The performance measurement systems makes it possible to communicate with the stakeholders of the organization.
Flexibility (Cronbach's alpha = .679)	
Enabling 10	I can take decisions on the basis of the performance information delivered by the performance measurement system.
Enabling 11	Performance measures can be added to the performance measurement system to meet specific work needs.
Enabling 12	Suggestions on which I can make decisions, arise from the performance measurement system.

All items were administered in Dutch. English translations for communication purposes.

Table 4: Exploratory factor analysis: factor loadings for explanatory variables and Cronbach's alpha

		Items	Cronbach's alpha	Factor loading
Controlled motivation			.749	
Conmot1	External (social)	I work to get the other's approval (e.g., supervisor, colleagues, family, clients...).		.686
Conmot2	External (monetary)	I work because others (e.g., employer, supervisor...) promise me that I will make more money if I put enough effort in my job.		.471
Conmot3	External (monetary)	I work because others (e.g., employer, supervisor…) promise me advancement or promotion opportunities if I put enough effort in		.443
Conmot4	External (social)	I work to avoid disappointing others (e.g., supervisor, colleagues, family, clients...).		.763
Conmot5	Introjection	I work because, as an employee of this company, I ought to put efforts in my job.		.593
Conmot6	Introjection	I work because it is my duty vis-à-vis my employer to put efforts in my job.		.635
Autonomous motivation			.819	
Autmot1	Identified	I work because what I do in this job has a lot of personal meaning to me.		.660
Autmot2	Identified	I work because I personally consider it important to put efforts in my job.		.387
Autmot3	Integrated	I work because this job represents well who I am deep down.		.601
Autmot4	Intrinsic	I work because I enjoy this work very much.		.767
Autmot5	Intrinsic	I work because this job fits well with the interests I have.		.711
Autmot6	Intrinsic	I work because the work I do is a lot of fun.		.802
Performance			.783	
Perf1		*Planning:* determining goals, policies, and courses of action. Work scheduling, budgeting, setting up procedures, setting goals or standards, preparing agendas, programming.		.620
Perf2		*Investigating:* Collecting and preparing information, usually in the form of records, reports, and accounts. Inventorying, measuring output, preparing financial statements, recordkeeping, performing		.258
Perf3		*Coordinating:* Exchanging information with people in the organization other than subordinates in order to relate and adjust programs. Advising other departments, expediting, liaison with other managers, arranging meetings, informing superiors, seeking		.590
Perf4		*Evaluating:* Assessment and appraisal of proposals or of reported or observed performance. Employee appraisals, judging output records, judging financial reports, product inspection, approving		.612

Perf5		*Supervising:* Directing, leading, and developing subordinates. Counseling subordinates, training subordinates, explaining work rules, assigning work, disciplining, handling complaints of		.784
Perf6		*Staffing:* Maintaining the work force of a unit of several units. College recruiting, employment interviewing, selecting employees,		.698
Perf7		*Negotiating:* Purchasing, selling, or contracting for goods or services. Tasks negotiations, contacting suppliers, dealing with sales representatives, advertising products, collective bargaining, selling		.317
Perf8		*Representing*: Advancing general organizational interests through speeches, consultation, and contacts with individuals or groups outside the organization. Public speeches, community drives, news		.430
Perf9		What do I think of my overall performance.		.713
PMS as enabling technology			.907	
Enabling1	Repair	The performance measures help me to start actions for improvement myself.		.786
Enabling2	Repair	The performance measurement system makes it possible to react in time, consequently be able to avoid problems.		.710
Enabling3	Repair	The performance measurement system makes it possible to put forward some measures which can serve as alarm bells.		.723
Enabling4	Internal transparency	I understand the performance measures in my domain.		.707
Enabling5	Internal transparency	I understand why certain performance measures are included in my domain.		.761
Enabling6	Internal transparency	There is information available about the current condition of the performance measures in my domain.		.791
Enabling7	Global transparency	The performance measurement system gives me an indication in how I execute my job.		.632
Enabling8	Global transparency	The link between my own tasks and the goals of the organization are clear.		.655
Enabling9	Global transparency	The performance measurement systems makes it possible to communicate with the stakeholders of the organization.		.547
Enabling10	Flexibility	I can take decisions on the basis of the performance information delivered by the performance measurement system.		.836
Enabling11	Flexibility	Performance measures can be added to the performance measurement system to meet specific work needs.		.424
Enabling12	Flexibility	Suggestions on which I can make decisions, arise from the performance measurement system.		.637

Table 5: Pearson correlation, mean, median (med), and standard deviation (StDev)

	1	2	3	4	Mean	Med	StDev
1. Controlled motivation	1				2.92	2.83	1.11
2. Autonomous motivation	-.026	1			5.78	5.83	.70
3. Performance	-.120	.229**	1		5.59	5.75	.85
4. Enabling PMS	-.031	.383**	.195**	1	5.31	5.33	.59

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table 6: Model fit statistics (measurement model)

	Model MA
χ^2	764.89
df	489
p-value	0.0000
RMSEA	.055
SRMR	.066
CFI	.95

Notes: n = 186

Table 7: Model fit statistics (structural model)

	Model SA	Model SE
χ^2	769.15	982.81
Df	491	493
χ^2/df	1.60	1.99
RMSEA	.057	.073
SRMR	.070	.087
CFI	.95	.90
NNFI	.95	.91
AIC	5,465.39	5,675.05
χ^2 difference test (Model A)		103.66 > 3.84

Notes: n = 186

Table 8: Path coefficients, t-statistics, and R^2 statistics structural model

Dependent variables	**Independent variables**			
	Enabling PMS	Controlled motivation	Autonomous motivation	R^2
Controlled motivation	-.06 (-.73)			0.004
Autonomous motivation	.45 (5.11)**			0.200
Performance		-.10 (-1.16)	0.35 (3.62**)	0.132

Each cell reports the path coefficient (t-value).

**,* Indicates a p-value of <.01; .05 in a one-tailed test.

Table 9: path coefficients, t-statistics lower and top management

Dependent variables	**Independent variables**					
	Top management (N = 124)			Lower management (N =60)		
	Enabling PMS	Controlled motivation	Autonomous motivation	Enabling PMS	Controlled motivation	Autonomous motivation
Controlled motivation	-.03 (-.26)			-.09 (-.63)		
Autonomous motivation	.41 (4.08)**			.35 (2.18)**		
Performance		-.11 (-1.00)	.17 (1.51)		-.02 (-.17)	.47 (2.42**)

Each cell reports the path coefficient (t-value).

**,* Indicates a p-value of <.01; .05 in a one-tailed test.

FIGURES

Figure 1: Structural model

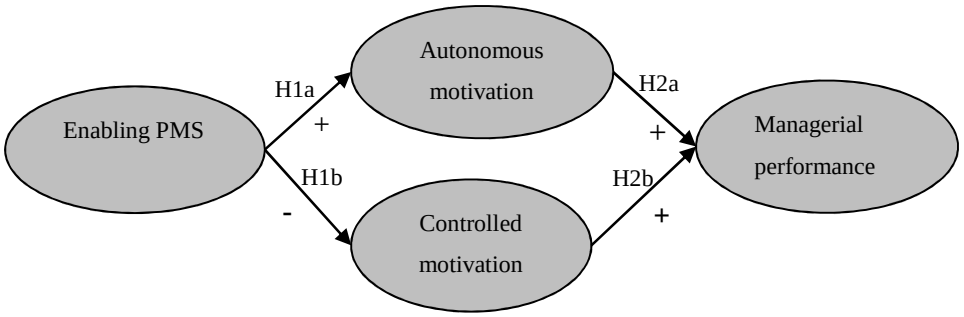
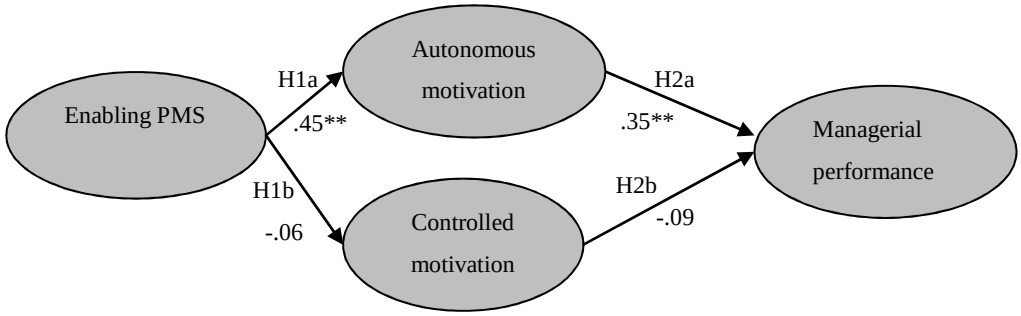
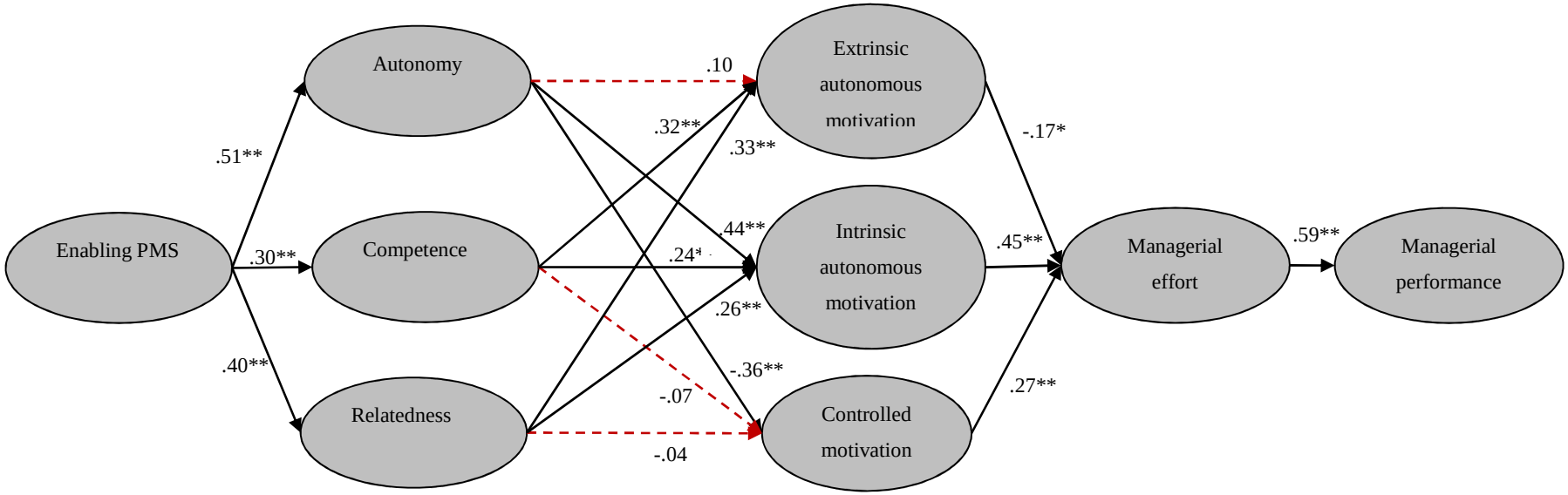


Figure 2: Path coefficients and t-values structural model (SA)



**, * indicates a p-value of <.01, .05 in a one tailed t-test

Figure 3: Path coefficients structural model (SF)



**, * indicates a p-value of <.01, .05 in a one tailed t-test

CHAPTER 4 - THE EFFECT OF MONETARY REWARDS ON AUTONOMOUS MOTIVATION IN AN ENABLING PERFORMANCE MEASUREMENT SYSTEM CONTEXT

ABSTRACT

This paper investigates the impact of monetary rewards on autonomous motivation in an enabling PMS context. The study uses survey data from 314 managers from different organizations. The results indicate that organizations benefit from performance measurement systems that are perceived as highly enabling. A highly enabling PMS leads to a higher level of autonomous motivation, when compared to a situation with a minimally enabling PMS or no performance measurement system. In organizations where the performance measurement system is perceived to be minimally enabling, the results indicate that perceived fairness of individual monetary rewards positively affects managers' autonomous motivation. The findings also reveal that the more the performance measurement system is perceived as enabling, the less effective a fair individual bonus is to enhance the level of autonomous motivation of managers.

Keywords: Performance measurement system, autonomous motivation, rewards, individual bonus, fairness

1. INTRODUCTION

Scholars and practitioners have been searching for variables and mechanisms which affect the motivation and the performance of managers in order to increase organizational performance. A performance measurement system (PMS) can be used to enhance organizational behaviour (Kaplan & Norton, 1992). Consequently, organizations spend an enormous amount of time on the development of management control systems (Franco-Santos & Bourne, 2005).

Rewards and incentive systems are key elements of a management control system. Incentives are often linked to the PMS. Rewards are considered pivotal in an organization's motivational arsenal (Rynes, Gerhart, & Parks, 2005). As such, many organizations link monetary rewards to performance and believe that so-called 'pay-for-performance' positively influences the motivation and performance of managers. Nevertheless, scholars who illustrate the importance, relevance, and positive impact of rewards (e.g. Fang & Gerhart, 2012; Kunz & Pfaff, 2002; Rynes et al., 2005) are as numerous as scholars who reveal a diminishing effect of rewards on outcome variables (e.g. Falk & Kosfeld, 2006; Kohn, 1993; Sliwka, 2007; Stone, Bryant, & Wier, 2010). Consequently, even after 30 years of research on this topic, scholars still stress the importance of investigating the effect of monetary rewards in relation to PMSs (Franco-Santos & Bourne, 2005; Franco-Santos, Lucianetti, & Bourne, 2012). Bonner and Sprinkle (2002), for example, indicate that the effect of monetary rewards will impact performance indirectly by influencing motivation, and subsequently, effort. Other studies on this topic stress the integration of potential mediating and moderating variables, such as the magnitude of the bonus (Gneezy & Rustichini, 2000; Pouliakas, 2010) and the degree to which the pay is perceived to be fair (Gagné & Forest, 2008).

From the different success stories and failures of the introduction of PMSs, scholars have already learned that PMS contexts in which managers work differ widely. In some situations, the PMS is developed and used in an enabling way; in other contexts, PMSs are introduced and used in a coercive way. Research in the domain of management control has pointed out the importance of the systems and processes to be enabling (e.g.; Hempel, Zhang, & Han, 2012; Parker, 2003). Wouters and Wilderom (2008) illustrated that manager attitudes are more positive when the PMS is developed and used in an enabling way, instead of in a coercive way.

To investigate the role of PMSs and other control related variables on performance, motivation has been put forward (Ankli & Palliam, 2012). To define motivation, this study uses the self-determination theory. This theory distinguishes two types of motivation: autonomous and controlled motivation (Ryan & Deci, 2000a). Autonomous motivation is argued to be the most effective type of

motivation, as it increases job satisfaction and job performance (Baard, Deci, & Ryan, 2004; Van den Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2010). In addition, employees thrive more when they are autonomously motivated regardless the level of controlled motivation these employees have (Van den Broeck, Lens, De Witte, & Van Coillie, 2013). Consequently, scholars point out the importance for organizations to strive for autonomous motivation to motivate employees (Ankli & Palliam, 2012). Therefore, this research will focus on the level of autonomous motivation, rather than the level of controlled motivation.

The aim of this paper is to investigate whether individual monetary rewards can have an effect on autonomous motivation when the organization uses an enabling PMS. To accomplish this goal, we determine whether the use of enabling PMSs on itself already positively influences the autonomous motivation of managers. We then determine whether linking individual monetary rewards to performance measures enhances the autonomous motivation.

The paper contributes to the literature in several ways. First, by focusing on the effect of an enabling PMS on autonomous motivation, this study answers the call for more research on the relation between performance measurement and managerial performance. (Bourne, Melnyk, Bititci, Platts, & Andersen, 2014). In addition, by integrating the effect of individual monetary rewards in the relationship between an enabling PMS and autonomous motivation, our research responds to the call for more research on the effect of monetary rewards in combination with PMSs (Franco-Santos & Bourne, 2005). Third, the interplay between monetary rewards and an enabling PMS is investigated while considering the fairness of the reward, the management level, and the magnitude of the bonus. These variables are indicated to interfere with the relationship between PMS and managerial behaviour.

The remainder of this paper is structured as follows. First, our study will be set out in a theoretical context. This will include a development of the hypotheses. Second, a description of our study will be presented; this will display details on the data collection process and the research methodology. Third, the results of the empirical tests will be outlined and the findings will be discussed. Fourth, the paper will end with the conclusions, limitations, and opportunities for future research.

2. BACKGROUND AND HYPOTHESIS DEVELOPMENT

2.1. PMS AND THE PERCEPTION OF AN ENABLING PMS

The presence of a robust PMS within an organisation results in significant progress towards the strategic goals, despite the absence of other factors (MacBryde, Paton, Bayliss, & Grant, 2014). Another fundamental tenet of management control systems is to motivate employees to achieve organizational goals (Liu & Leitch, 2013). Recent research stresses the importance of using the PMS to support operational managers to motivate and enable higher level managers to improve operations (Wouters, 2009) and support managers whose performance is being measured (Wouters & Roijmans, 2011). This and many other studies have revealed that a PMS is seen both by scholars and practitioners as a system capable of improving organizational performance, managerial performance, and managerial motivation. Nevertheless, performance measurement and management is not without its problems and is accused of delivering an unclear and inconsistent impact on performance (Franco-Santos et al., 2012). Consequently, further research into the effectiveness of PMSs is necessary. To obtain insights into effectiveness, scholars have introduced the concept of enabling formalization in a management control system context (e.g.; Ahrens & Chapman, 2004; Wouters & Wilderom, 2008). This concept finds its origin in the context of workflow formalization (Adler & Borys, 1996).

The concept of enabling formalization was originally developed to explain the efficiency and flexibility of work processes (Adler & Borys, 1996). This concept was translated into a management control system context (Ahrens & Chapman, 2004). In its original context, Adler and Borys (1996) differentiated between two types of formalization, namely coercive and enabling formalization. While coercive formalization aims to force employee compliance, enabling formalization makes employees feel facilitated or motivated by the rules and systems in place (Wouters & Wilderom, 2008).

Scholars indicate that both enabling and coercive formalization have the power to improve individual behaviour (Baum & Wally, 2003; Helin, Jensen, Sandstrom, & Clegg, 2011; Langfred & Moye, 2004; Patel, 2011). Although both enabling and coercive formalization are stated to be more constraining to an individual's ability than a lack of formalization, the research indicates that enabling formalization is more positively associated with outcome variables, such as autonomy, than coercive formalization (Hempel et al., 2012; Langfred & Moye, 2004). Other scholars have found an indication toward the superiority of enabling above coercive formalization to increase the mastery of employee tasks (Hempel et al., 2012), enlightenment, self-regulation (Helin et al., 2011), and knowledge performance (Li, Lee, Li, & Liu, 2010). Moreover, employees are more likely to have a positive

attitude toward formalized systems, such as PMS, when it enables them to better perform their tasks. It will be more negative if it functions as a mean by which management attempts to coerce effort and compliance (Wouters & Roijmans, 2011). This indicates that an enabling formalization delivers better results toward managerial behaviour than coercive formalization. Therefore, this research focuses on the enabling type of formalization.

An enabling formalization requires the presence of four features: repair, internal transparency, global transparency, and flexibility (Adler & Borys, 1996). The first feature is important, as there needs to be *repair* possibilities. The system must make it possible to deal with unexpected breakdowns and identify opportunities for improvement (Adler & Borys, 1996). Consequently, repair means that users can mend and improve the work process themselves, rather than allowing breakdowns and other non-programmable events to force work processes to a halt (Wouters & Roijmans, 2011). The second essential feature is *internal transparency*. Internal transparency means that managers fully understand the logic of the system and have a view on the status of the elements the system comprises (Adler & Borys, 1996). The third feature is *global transparency* which delivers insights into how local systems and elements fit into the organization as a whole (Ahrens & Chapman, 2004). Such a system offers the employees an understanding of where their own tasks fit in the organization as a whole (Wouters & Roijmans, 2011). The fourth feature is that it must be possible to adapt the PMS, when necessary (Ahrens & Chapman, 2004). In other words, it has to be *flexible* so that users can make controlling decisions after enabling systems have provided the information (Wouters & Roijmans, 2011).

Adler and Borys (1996) indicated that enabling formalization will influence the level of identified motivation. Other research in the management control domain stresses the pivotal role of motivation to explain the impact on performance (e.g.; Ankli & Palliam, 2012). Consequently, this study will use autonomous motivation to indicate the degree to which an enabling PMS is effective.

2.2. ENABLING PMS AND AUTONOMOUS MOTIVATION

This paper focuses on the self-determination theory (SDT). This theory was developed in 1985 by Deci and Ryan. It has recently gained more attention in the management accounting context (e.g., Ankli & Palliam, 2012).

SDT states that motivation should not be treated as a unitary concept. Moreover, the theory indicates that different motivation types can be distinguished. These types can be categorized in two major categories: autonomous and controlled motivation. In a working context, it is important to: (1)

consider SDT's autonomous and controlled motivation separately, and (2) consider motivation as a predictor of performance (Ankli & Palliam, 2012). Consequently, motivation should be considered as the outcome variable in this relationship.

Looking at the SDT in more detail illustrates that SDT distinguishes several motivation types (Roth, Assor, Kanat-Maymon, & Kaplan, 2007). This new type of categorization defines more than one type of extrinsic motivation, next to intrinsic motivation. The types of extrinsic motivation are external regulation, introjected regulation, identified regulation, and integrated regulation (Ryan & Deci, 2000b). These types differ in the reason for behaving.

Identified and integrated regulation, together with *intrinsic motivation,* are the most internalized motivation types. Consequently, they are classified under autonomous motivation. When people are motivated autonomously, people engage in an activity because they find it interesting; they do the activity volitionally (Gagne & Deci, 2005). Autonomous motivation consists of the motivation types that involve the experience of volition and choice (Vansteenkiste, Lens, & Deci, 2006). This is in contrast to controlled motivation. If people are motivated in a controlled manner, participating in the activity involves a sense of pressure or a sense of forced engagement (Gagne & Deci, 2005). Controlled motivation involves the experience of being pressured and coerced (Vansteenkiste et al., 2006). This latter type of motivation contains the two remaining types of extrinsic motivation, namely *external regulation and introjected regulation.*

Autonomous motivation and controlled motivation can both result in high involvement in an activity (Vansteenkiste, Niemiec, & Soenens, 2010). However, individuals are most resourceful and innovative when they feel motivated, largely as a result of their interests, inner satisfactions, and work challenges (Ankli & Palliam, 2012). Therefore, SDT stresses the importance of autonomous motivation above controlled motivation (Vansteenkiste et al., 2010; Wong-On-Wing, Guo, & Lui, 2010). Autonomous motivation is more powerful in creating well-being, job satisfaction, and performance (Baard et al., 2004; Mills, 2011; Ryan & Deci, 2000b). Moreover, when employees have a high level of autonomous motivation, the level of controlled motivation does change the level of effort employees put into their job (Van den Broeck et al., 2013). An organization should therefore concentrate on creating autonomous motivation over controlled motivation.

To create and enhance autonomous motivation, there must be an autonomy supportive context (Gagne & Deci, 2005). An autonomy supportive context appears when an employee's three basic psychological needs (autonomy, competence, and relatedness) are supported. The need for *autonomy* involves experiencing choices and feelings, like being the initiator of one's own actions

(deCharms, 1968; Deci, 1975; according to Baard et al., 2004). The feeling of *competence* involves being able to attain the desired outcomes for an optimally challenging task (e.g. Skinner, 1995; White, 1959; according to Baard et al., 2004). The need for *relatedness*, which should also be satisfied to augment autonomous motivation, refers to a longing to experience positive relationships and engages with others (Evelein et al., 2008). SDT suggests that the level of autonomous motivation and its enhancement are determined by the degree to which people can satisfy the three basic psychological needs (Gagne et al., 2010). Consequently, when the PMS creates an atmosphere in which the three basic needs are supported, autonomous motivation can be enhanced.

The presence of an enabling PMS should support the three basic psychological needs. Previous research has indicated that companies with a PMS delegate greater autonomy to their business units, which consequently affects the organization performance positively (De Geuser, Mooray, & Oyon, 2009). The features within an enabling PMS can support the three basic psychological needs. First, repair can support the need for competence and the need for autonomy. The presence of repair possibilities can provide managers with a feeling of autonomy. Repair can also contribute to the managers' feeling of competence, as they will know how the company wants them to react if a certain situation arises. Second, internal transparency supports a feeling of competence as the manager will have a clear and detailed tool to control the department. Moreover, internal transparency can also lead to an increase in the feeling for autonomy. The third feature is global transparency that can support two of the three basic psychological needs. Through the link of local systems with the company as a whole, the feeling of relatedness can be supported. In addition, the manager will feel more competent as the global transparency makes it possible to have a clear view of how local systems and elements fit into the organization as a whole. Fourth is flexibility; flexibility will enhance the managers feeling of autonomy, as they obtain the opportunity to change the system, if necessary. The need for relatedness might also be supported as the managers feel more connected to the organization as they get the opportunity to make changes to the PMS when necessary. Consequently, when managers perceive the PMS as enabling, this will lead to an autonomy supportive context as the different features (repair, internal transparency, global transparency, and flexibility) support the three basic psychological needs. Subsequently, an augmented level of autonomous motivation will be created. This indicates the superiority of a situation in which an enabling PMS is used over a situation in which no PMS, or no enabling PMS, is used.

H1: Managers who perceive their PMS as highly enabling will have a higher level of autonomous motivation than managers who do not have a PMS or who perceive their PMS as minimally enabling.

2.3.Individual monetary rewards and autonomous motivation

Research on the consequences of monetary rewards on motivation conflict in their findings (Franco-Santos & Bourne, 2005; Libby & Lipe, 1992). Some scholars indicated that monetary rewards have a detrimental effect on autonomous motivation (Deci, Koestner, & Ryan, 1999; Falk & Kosfeld, 2006; Kunz & Linder, 2012; Weibel, Rost, & Osterloh, 2007). Kunz and Linder (2012), for example, found that monetary rewards have a detrimental effect on identified and integrated motivation (the two extrinsic types of autonomous motivation). Although detrimental effects exist, they do not appear in all situations (Deci et al., 1999). Other scholars found that in a working environment, the introduction of rewards does not tackle the level of intrinsic motivation and enhance the level of extrinsic motivation (Decoene & Bruggeman, 2006; Kunz & Pfaff, 2002; Van Herpen, Van Praag, & Cools, 2005). More recently, research on pay for individual performance even indicated that intrinsic motivation is higher under pay for individual performance (Fang & Gerhart, 2012). As a result research on rewards is currently at a crossroads (Bourne et al., 2014).

Through the literature on autonomous motivation we already became aware of the importance of an autonomy supportive context to improve autonomous motivation. Consequently, only when rewards enhance the basic psychological needs, a higher level of autonomous motivation can be reached. Nevertheless, not every reward in every situation can lead to an enhanced level of autonomous motivation. A reward which is linked to the PMS has the opportunity to fulfil the three psychological needs. Monetary rewards used in a PMS context are linked to the targets set forward in the system. The link with the targets creates the opportunity to support the three basic psychological needs: autonomy, competence and relatedness. Autonomy can be enhanced if rewards are linked with the defined targets. In this way the manager can get the feeling that he is initiator of his own actions in order to reach the defined targets. The manager's level of competence can be supported when the proposed targets are achievable. The feeling of relatedness can be fulfilled if the rewards make it possible to strengthen the link between the manager and the organization and his colleagues. However, rewards in se are often not sufficient enough to create the necessary support toward satisfaction of the three basic psychological needs, hence autonomous motivation. Often only a situation characterised with procedural justice is associated with a positive outcome on the needs and subsequently on autonomous motivation.

The term procedural justice refers to whether the reward is fairly determined or not (Hartmann & Slapnicar, 2012a). Procedural justice is a variable that is positively associated with the three basic psychological needs (Boudrias et al., 2011; Gillet et al., 2013). Other psychological research

investigating workplace autonomous motivation also indicates that procedural justice supports the three basic psychological needs; which subsequently enhances autonomous motivation (Gagné & Forest, 2008). Moreover, in a management control context the role of procedural justice is stressed. The organizational literature provides evidence that participants find fairness perceptions very important. The organizations procedures, which explains important workplace outcomes, such as motivation, should be fair (Hartmann & Slapnicar, 2012b). In addition, trust and justice are the underlying mechanisms often mentioned as moderators in the relationship between monetary rewards and performance related outcomes (e.g.; Burney, Henle, & Widener, 2009; Sliwka, 2007). In our study, we will refer to this procedural justice of the monetary reward as fairness. It is expected that only when a reward is characterised with a certain degree of fairness an augmentation of the autonomous motivation will occur. Fairness of the individual bonus affects the manager's level of autonomous motivation. This results in following hypothesis:

H2: The higher the level of fairness of the individual monetary reward, the higher the level of autonomous motivation.

2.4. ENABLING PMS, FAIR INDIVIDUAL MONETARY REWARDS AND AUTONOMOUS MOTIVATION

When the PMS in se is already highly enabling, the three basic needs will already be supported and the rewards will be less effective as they do not improve the clarity of the strategy and targets of the organization. In contrast, in a situation where there is a minimally enabling PMS, the possibility to increase the level of autonomous motivation is higher. This increased possibility results from the lower level of autonomous motivation that is associated with a minimally enabling PMS. As a result, the manager can get indication on the goals of the organization and the expectations toward him, through the monetary rewards which are linked to several targets. These targets give an indication concerning the goals of the organization. This delivers opportunities that can enhance the satisfaction of autonomy, competence and relatedness; and subsequently augment autonomous motivation. However, the higher the level of enabling PMS, the lower the power of the rewards. In this situation, the managers' three psychological needs will already be highly supported. The lower the enabling PMS, the more support rewards can offer to the three basic psychological needs of the managers.

H3: The lower the level of enabling PMS, the higher the strength of fairness of the bonus to affect the manager's autonomous motivation. On the contrary, the higher the level of enabling PMS, the lower the positive relationship between fairness of the bonus and the autonomous motivation.

Notably, previous literature indicates the pivotal role of the magnitude of the reward. “Pay enough or do not pay at all” is the conclusion in Gneezy (2000). Pouliakas (2010) found that individual rewards were only effective if they were large enough. As a result, the possibility exists that managers who receive a small reward do not experience the predicted outcomes because the reward is too small to attract the manager’s attention toward the important targets. Consequently, if the reward is not large enough, it will have no opportunity to create direction and clarity. Subsequently it will not support the three psychological needs. Hence, autonomous motivation is not affected. Therefore, the proposed hypothesis will only occur when the reward is large enough. This study will control for this by integrating the magnitude of the bonus as a variable in the analysis.

3. DATA COLLECTION PROCESS AND THE RESEARCH METHODS

To collect data, an online questionnaire using a sample of Belgian managers was conducted. To optimize the quality of the questionnaire, we followed some recommendations of Dillman et al. (2009). We extensively pretested the questionnaire in three different steps. First, a pilot test of the questionnaire was distributed through a modern communication channel (Linked In) to obtain general feedback on our questionnaire. In total, 71 managers filled out the questionnaire as a pre-test. We used their comments to improve the wording and the order of the questionnaire. Second, this second version was reviewed by a multidisciplinary team of academics with knowledge in management accounting, self-determination theory and survey design. They made suggestions to improve the validity and reliability of the measured constructs and the control variables. This resulted in a third draft of the questionnaire. This third draft involved cognitive interviews with two potential respondents from the selected population (Dillman, 2000). The purpose of this interview was twofold. First, we wanted to make sure that people were able to navigate through the questionnaire appropriately. Second, we wanted to be reassured that the respondent interpreted the questions in the way it was intended. To realize this, one of the authors was present when these two respondents used the online tool to fill out the questionnaire. If they thought it was necessary, they could pose the author questions. To finalize this pre-test, the author asked some questions related to the questionnaire. For example, the author asked the respondent why he/she hesitated to fill out certain questions. Some minor adaptations to the questionnaire were then made, primarily to improve readability.

For this study, we used Dutch-speaking managers that worked in production, development, logistics and shared service centres at the middle management or top management level at Belgian companies with at least 100 employees. We used the minimum size of 100 employees to make sure

the selected managers were employed at a company in which a PMS can be used for both control and information purposes; in addition, a bonus system might be in use.
The survey was written in Dutch. Therefore, we sampled Dutch-speaking managers (about 60% of the inhabitants of Belgium use Dutch as their native language). Managers from production, development, logistics, and shared services were selected to obtain a broad range of respondent functions to achieve a larger generalization of the results. We obtained 2,411 e-mail addresses from a direct marketing company that specialized in managerial functions.

We sent out an invitation with a link to the online questionnaire to participate in the questionnaire to these 2,411 managers (June 2013). 343 managers did not receive the message; they either left the firm, changed their e-mail address, or had an email address that gave us a mail delivery failure message. Consequently 2,068 managers were reached and 240 managers (11.60%) returned the questionnaire after a first invitation. Another 140 managers completed the questionnaire after having received a reminder three weeks later. In total, 380 people filled out the questionnaire (18.38%). As some of the respondents did not complete the entire questionnaire, their responses were removed; this resulted in a total of 358 (17.3%) filled out questionnaires. The response rate is comparable with other similar research (e.g. Widener, 2007).

Before analysing the data, some checks to confirm the robustness of the data were performed. This involved testing for response bias. A comparison between the early and late respondents was made. The first 10% of respondents were compared with the last 10% of the respondents. No significant differences on any of the variables (dependent, independent, and control variables) were detected.

We then controlled for outliers. The Cook's distance analysis indicated two points as possible outliers. As these points may distort the outcome and accuracy of the performed regressions, we decided to eliminate them from the sample. We also looked at the extreme data points, in relation to our dependent variable. Autonomous motivation is a variable measured on a 7-point Likert scale (1: completely disagree, 7: completely agree) that is slightly skewed to the right. The data for this variable revealed a normal distribution between four and seven. Only respondents had an average of less than three. These respondents were deleted from the sample. In this way a normal distribution with variance between four and seven appears.
One other respondent got deleted from the sample, as the respondents' percentage of maximum bonus was smaller than the percentage of the minimum bonus; this survey was eliminated to maintain the accuracy of the analyses.

In addition, managers at different management levels might use a PMS differently (Malina & Selto, 2001). Besides using the system to control, formulate strategy and communicate to serve higher-level managers, a PMS also supports the people whose performance is being measured (Wouters & Roijmans, 2011). As a result, managers at different levels might benefit differently from the presence of an enabling PMS. The way in which first level managers are able to use the PMS often differs from how it is used by middle and top management. To avoid a very heterogeneous group, we deleted the first level managers (N=36) from the dataset.

In total, 314 questionnaires from middle and top managers are used in the analyses. To control for differences that might exist between middle and top level managers, a control variable "management level" will be used when the proposed hypotheses are tested.

"Insert Figure 1 here"

The demographics of the respondents were split in three groups. Panel A illustrates the data of all 314 respondents. The analysis of Hypothesis 1 will use the responses of all 314 managers. Concerning hypothesis 2, we focused on managers confronted with a PMS (see Figure 1). Managers whose organization does not have a PMS are excluded from this analysis. 189 respondents (60.19%) indicated that their organization used a PMS. The demographics of these managers can be found in Panel B. In addition, of those 189 managers, 115 managers also received an individual monetary bonus. For the third hypothesis, only the respondents that received an individual bonus were included (N = 115). In Panel C, the demographics of those respondents are displayed.

When looking at the demographics of the respondents, we noticed that most respondents were male (approximately 80%). On average, they were 48 years old (Table 1). Most of the organizations were situated in the manufacturing or service business (Table 2).

"Insert Table 1 and Table 2 here"

3.1. VARIABLE MEASUREMENT

The degree to which a *PMS is perceived as enabling* is measured using a 7-point Likert scale (Van der Hauwaert & Bruggeman, 2014). The scale consists of 12 items measuring the four features of an enabling PMS (repair, internal transparency, global transparency, and flexibility). The scale was pretested and tested in different studies delivering a Cronbach's alpha of .928 (study with 186 respondents) and .907 (study with 45 respondents). In Table 3, more information on the factor loadings and Cronbach's alpha (in this study) is provided.

"Insert Table 3 here"

To obtain an indication of the *rewards,* the respondents had to answer whether their firm did or did not make use of individual monetary rewards. Further information about the rewards and the reward system was asked when the respondent indicated it was possible to receive a reward. Our proposed model makes use of: (1) the magnitude of the individual reward (continuous variable); and (2) the level of fairness of the individual bonus (continuous variable).

The magnitude of the individual bonus was measured by taking the difference between the maximum individual bonus managers could receive (in a percentage of net wage) and the minimum individual bonus managers could receive (in a percentage of the net wage).

The level of fairness of the individual reward was measured using three 7-point Likert style questions. In total, 134 respondents indicated that they received an individual bonus and answered the three questions from which we could deviate the degree to which they perceived the individual bonus as fair. The basis for the formulation of these questions was found in a study by Hartmann and Slapnicar (2009). An adapted version of the questions were introduced in our questionnaire. In our version, we adapted the questions to make them suitable for our research. The items used can be found in Table 3. Factor loadings were all above .8; Cronbach's alpha was .901.

Motivation was measured using an adapted version of the second motivation at the work scale (MAWS2 scale). This scale was still under construction when the questionnaire was developed and sent to the respondents[1]. As a result, we pretested this questionnaire to check the validity and reliability of the items. The pretest resulted in a 12 item scale to measure autonomous motivation (six items) and controlled motivation (six items). The Cronbach's alpha for these two variables were, respectively, .832 and .794. In this study, we focus on the effect on autonomous motivation; consequently, the six items on autonomous motivation are integrated into the analyses. Information on the factor loadings and Cronbach's alpha in this research can be found in Table 3.

The management level is used in this study as *control variable*. The management level indicates whether the manager is a middle manager or a top manager. This variable is introduced as previous research indicated that management level differences could lead to differences in managerial behaviour (e.g.; Malina & Selto, 2001; Wouters & Roijmans, 2011).

[1]The scale has been validated and published: (Gagné et al., 2014)

4. RESULTS AND DISCUSSION

4.1. DESCRIPTIVES

After the data were collected an initial screening of the variables took place. The descriptives of the independent and dependent variables are shown in Table 4. In Panel A, the data of all 314 respondents are displayed. Panel B illustrates the descriptives of the dependent and independent variables of the managers whose organization used a PMS (N = 189). In Panel C the information concerning the respondents that have both a PMS and an individual monetary reward (N = 115). Although the dependent variable is slightly skewed to the right, it is normally distributed between the ranges of 4 and 7.

"Insert Table 4 here"

From the Pearson correlation table, we can conclude that there is no indication of multicollinearity (Table 5). This is confirmed by the VIF in the linear regression analyses. No variable exceeded the value of 1.2. The correlations indicate a relationship between an enabling PMS and autonomous motivation ($r = .239$, $p = .001$), as well as between fairness and autonomous motivation ($r = .233$, $p = .002$). The magnitude of the individual bonus does not correlate with autonomous motivation ($r = .016$, $p = .840$). Nevertheless, there exists a positive correlation between the magnitude of the individual bonus and the fairness of the individual bonus ($r = .197$, $p = .010$). The tests with the demographic variables (untabulated) indicated that the management level is the only demographic variable that is correlated with the dependent or one of the independent variables. The management level correlates with fairness ($r = .232.$, $p = .002$). Consequently, management level will be integrated as control variable in the analyses.

"Insert Table 5 here"

4.2. HYPOTHESES TESTING

Hypothesis 1 which states that managers who perceive their PMS as highly enabling will have a higher level of autonomous motivation than managers who do not have a PMS or who perceive their PMS as minimally enabling, is tested with an ANCOVA. This first analysis gives us an indication on whether having a PMS delivers a higher level of autonomous motivation. The managers whose organization has a PMS were compared to the managers whose organization did not have a PMS. A comparison between managers with a highly enabling PMS, managers with a minimally enabling

PMS, and managers without an enabling PMS was then conducted. To distinguish between managers with a highly enabling and a minimally enabling PMS, we split up the managers whose firm had a PMS in two groups. The first group perceived the degree in which the PMS is enabling as minimal [lower half of median split (< 5.33)], while the upper half experienced a highly enabling PMS (> 5.33)[2]. The results pointed toward a significant difference between these three groups (Table 6).

Further analysis through the least significant difference revealed the superiority of a PMS perceived as highly enabling. A PMS perceived as highly enabling delivers a level of autonomous motivation that is significantly higher than the level of autonomous motivation in the condition where there is no PMS (p = .003) or where the PMS is perceived as minimally enabling (p = .029). The level of autonomous motivation of a manager that perceives the PMS as minimally enabling does not differ significantly from the level of autonomous motivation of the managers whose organization had no PMS (p = .525). These findings support Hypothesis 1, indicating the importance of a highly enabling PMS. Hence, implementing a PMS is not per se enough to increase autonomous motivation. The degree to which the PMS is perceived as enabling plays a pivotal role. These results provide support of the pivotal role of enabling when a PMS is implemented and used in the organization.

"Insert Table 6 here"

To investigate the power of rewards when an enabling PMS is in use, a hierarchical regression analysis is conducted. The degree to which the PMS is seen as enabling is integrated in the analysis as a continuous variable. This continuous variable ought to give us the most detailed information on this matter[3].

Previous research already indicates the importance of several variables. One important variable that rose in several management control related studies is fairness. Only a fair individual bonus might increase the level of autonomous motivation. Therefore, hypothesis 2 indicates that the higher the level of fairness of the individual monetary reward, the higher the level of autonomous motivation. This will be tested together with hypothesis 3 in a hierarchical regression analysis. Hypothesis 3 states that The lower the level of enabling PMS, the higher the strength of fairness of the bonus to

[2] The analysis has also been conducted when using "5" as cut-off to determine whether the PMS is minimally enabling rather than highly enabling. This means that the respondent will be classified as perceiving the PMS as highly enabling when he/she indicated that on average he/she at least agrees with the statements on enabling PMS. The results are the same as when the analysis is done when using the median as cut-off.

[3] A regression in which the perception on enabling PMS is measured as a categorical variable – as in an analysis for Hypothesis 1- has also been conducted. This test delivered the same results.

affect the manager's autonomous motivation. The hierarchical analysis makes it possible to evaluate: the effect of an enabling PMS on autonomous motivation while including management level as control variable, and the effect of an enabling PMS and fairness of the individual bonus on autonomous motivation (full model), while taking the magnitude of the bonus into consideration, and controlling for management level. In the full model we can also identify whether the expected relationship between fairness and autonomous motivation exists. This method makes it possible to compare the additional explaining power of the different models. The results are displayed in Table 7 and the formula of the full model is shown below.

$$\text{Autmot} = b_0 + b_1\text{EPMS} + b_2\text{FAIR} + b_3\text{MAG} + b_4\text{MANLEV} + b_5\text{EPMS*FAIR} + b_6\text{EPMS*MAG} + b_7\text{FAIR*MAG} + b_7\text{EPMS*FAIR*MAG} + \varepsilon$$

Autmot = level of autonomous motivation (continuous)

b_0 = intercept

EPMS = degree to which the PMS is perceived as enabling (continuous)

FAIR = perception of the degree to which the bonus is fair (continuous)

MAG = magnitude of the bonus (continuous)

MANLEV = dummy management level (categorical: middle/top)

ε = error term

The introduction of fairness of the individual monetary rewards can add in explaining the variance. The full model displays a R^2 adjusted of 10%, while the model with only enabling PMS explained 6.30%. Not only the interaction effect of fairness and an enabling PMS is significant ($t = -1.989$, $p = .049$); the main effect of fairness on autonomous motivation is significant ($t = 2.246$, $p = .027$). As a consequence, hypothesis 2 indicating a higher level of fairness is associated with a higher level of autonomous motivation is confirmed. In addition, evidence for hypothesis 3 has been found. The lower the perception of an enabling PMS, the more the managers' autonomous motivation increases as the bonus is perceived more fair. The higher the perception of the PMS as enabling, the less susceptible the manager is towards the introduction of unfair bonuses.

"Insert table 7 here"

In contrast to previous findings on the magnitude of the bonus (e.g.; Gneezy & Rustichini, 2000; Pouliakas, 2010) no deterioration of the findings appeared when the manager gets a small reward. Even more, the magnitude of the bonus did not matter at all. A graphical reproduction of the

magnitude of the bonus in relation to autonomous motivation (untabulated) revealed data points that formed a line with a slope of zero. The regression analysis confirms this finding and extent it by indicating no significant relationship on the dependent variable even in combination with fairness and enabling PMS. The findings of this study might deviate from those of previous studies as our research concentrates on middle and top managers, whereas the previous research uses a sample that is representative for the whole population, or uses students as participants in the study. As research indicates potential differences might already appear when top and middle managers are compared (Malina & Selto, 2001; Wouters & Roijmans, 2011), there might also be differences between employees from other organizational levels and students.

In order to visualize the findings, the categorical variable of the enabling PMS, which distinguishes between a minimally perceived and highly perceived enabling PMS (median split), is used[4]. The graph (Figure 2) displays the robustness of autonomous motivation in the situation where the managers perceive the PMS as highly enabling. When the PMS is perceived as minimally enabling, there is a positive association between the managers' autonomous motivation and the level of perceived fairness of the individual bonus. Moreover, the more the individual reward is perceived as fair, the higher the level of autonomous motivation. These findings indicate that it is not interesting to integrate individual monetary rewards when the PMS is perceived as highly enabling.

"Insert Figure 2 here"

5. CONCLUSIONS

This paper investigates the effect of monetary rewards on autonomous motivation in an enabling PMS context. Our results illustrate that managers' autonomous motivation is significantly higher when the PMS is perceived as highly enabling. In other words, the degree to which the PMS is enabling influences the autonomous motivation. In addition, the fairness of the individual bonus positively influences the level of autonomous motivation. A significant interaction effect between enabling PMS and fairness on autonomous motivation indicates that the effect of monetary rewards on autonomous motivation is influenced by the perceived fairness of the bonus. The data indicate that in organizations where the performance measurement system is perceived to be minimally enabling, the perceived fairness of individual monetary rewards positively affects managers' autonomous motivation. The findings also reveal that the more the performance measurement

[4] The analysis with the categorization delivered the same results as the analysis with the continuous variable on enabling PMS.

system is perceived as enabling, the less effective a fair individual bonus is to enhance the level of autonomous motivation of managers.

These findings contribute to the discussion on the effectiveness of rewards to improve the motivation and performance of managers. In line with the expectations of Bonner and Sprinkle (2002) and Fang and Gerhart (2012), we find a positive effect of monetary rewards on autonomous motivation. In the situation where the managers' perceive the PMS as minimally enabling, the introduction of monetary rewards improves autonomous motivation. Nevertheless, not all situations result in anenhancement of autonomous motivation. Consequently, we cannot completely contradict the findings of Kunz and Linder (2012). Those authors are more nuanced and state the possibility of the existence of the detrimental effect of rewards on autonomous motivation. Our data do not illustrate a detrimental effect, however they show that augmentation of the autonomous motivation is practically non-existent in a highly enabling PMS context.

Deci et al. (1999) stated that not every situation will lead to a change in the level of autonomous motivation. In our search, we concentrated on individual monetary rewards in a PMS context. The integration of the degree to which the PMS is perceived as enabling makes it possible to contribute to the search of the consequences of monetary rewards on managerial behaviour. Up to now, there have been conflicts in the findings on the effects (Franco-Santos & Bourne, 2005). Distinguishing situations with a highly and a minimally enabling PMS makes it possible to make a better prediction of the power of rewards. The presence of a highly enabling PMS in combination with a fair monetary reward results in only a small change of the autonomous motivation. Nevertheless, when there is a minimally enabling PMS in combination with a fair monetary reward augmentation of the level of autonomous motivation is discovered.

This research was able to provide some interesting findings; nevertheless, this study also has limitations that are worth considering. The first limitation is that the measures in this study were self-reported measures. Although it is not evident to use self-reported measures to measure managerial behaviour, several scholars indicate that self-reported measures are reliable (Hall, 2011; Mills, 2011). The second limitation occurs when investigating the effect of rewards. We took monetary individual rewards into consideration, which is only a small part of the possibilities an organization has to reward their managers. Consequently, a suggestion for further research is to gather more details on other rewards (e.g., group rewards, promotion opportunities) used in organizations to stimulate motivation and performance.

The third limitation possible lies in the research method. We used a large online questionnaire to measure the effect of rewards on motivation in an enabling context, which made it possible to collect data in a heterogeneous group of managersand which increased the possibility of generalization. However, the counterpart is that such a large sample is very complex. Hence, as rewards are also very multifaceted, it might lead to overlooking some possible confounding variables. This study tried to deal with this issue by controlling for certain variables that might influence the relationship (e.g., management level). Nevertheless, there might be other confounding factors not previously defined in the literature that might have an influence. Executing an experiment could be an interesting line of future research to shed light on the investigated relationships, as it is offers the opportunity to control certain variables.

This study contributes to practice through the indication of the importance of creating a highly enabling PMS. In addition, organizations that have a highly enabling PMS will benefit less from a fair individual monetary reward. An organization where the PMS is perceived as minimally enabling will benefit from the introduction of individual monetary rewards, but only when the reward is perceived as fair. The fairer the reward, the larger the impact of the individual monetary reward on the autonomous motivation. The introduction of an individual monetary reward can bring the autonomous motivation of managers to the same level as the level of autonomous motivation from managers that perceive their PMS as highly enabling. Therefore, organizations should try to achieve a highly enabling PMS in order to obtain a high autonomous motivation without the need for additional monetary rewards.

6. REFERENCES

Adler, P. S., & Borys, B. (1996). Two types of bureaucracy: Enabling and coercive. *Administrative Science Quarterly*, 41(1), 61-89.

Ahrens, T., & Chapman, C. S. (2004). Accounting for flexibility and efficiency: A field study of management control systems in a restaurant chain. *Contemporary Accounting Research*, 21(2), 271-301.

Ankli, R. E., & Palliam, R. (2012). Enabling a motivated workforce: exploring the sources of motivation. *Development and Learning in Organizations*, 26(2), 7-10.

Baard, P. P., Deci, E. L., & Ryan, R. M. (2004). Intrinsic need satisfaction: A motivational basis of performance and well-being in two work settings. *Journal of Applied Social Psychology*, 34(10), 2045-2068.

Baum, J. R., & Wally, S. (2003). Strategic decision speed and firm performance. *Strategic Management Journal*, 24(11), 1107-1129.

Bonner, S. E., & Sprinkle, G. B. (2002). The effects of monetary incentives on effort and task performance: theories, evidence, and a framework for research. *Accounting Organizations and Society*, 27(4-5), 303-345.

Boudrias, J.-S., Boudrias, P., Desrumaux, P., Gaudreau, K., Nelson, L., Brunet, A., & Savoie. (2011). Modeling the experience of psychological health at work: The role of personal resources, social-organizational resources, and job demands. *International journal of stress management*, 18(4), 372-395.

Bourne, M., Melnyk, S. A., Bititci, U., Platts, K., & Andersen, B. (2014). Emerging issues in performance measurement. *Management accounting research*, 25(2), 117-118.

Burney, L. L., Henle, C. A., & Widener, S. K. (2009). A path model examining the relations among strategic performance measurement system characteristics, organizational justice, and extra- and in-role performance. *Accounting Organizations and Society*, 34(3-4), 305-321.

De Geuser, F., Mooray, S., & Oyon, D. (2009). Does the balanced scorecard add value? Empirical evidence on its effect on performance. *European Accounting Review*, 18(1), 93-122.

Deci, E. L., Koestner, R., & Ryan, R. M. (1999). The undermining effect is a reality after all - Extrinsic rewards, task interest, and self-determination: Reply to Eisenberger, Pierce, and Cameron (1999) and Lepper, Henderlong, and Gingras (1999). *Psychological Bulletin*, 125(6), 692-700.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York, NY: Plenum Press.

Decoene, V., & Bruggeman, W. (2006). Strategic alignment and middle-level managers' motivation in a balanced scorecard setting. *International Journal of Operations & Production Management*, 26(3-4), 429-448.

Dillman, A. (2000). *Mail and internet surveys - The tailored design method*. New York, NY: John Wiley & Sons.

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2009). *Internet, mail, and mixed-mode surveys - The tailored Design Method*. New-Jersey: John Wiley & Sons, Inc.

Falk, A., & Kosfeld, M. (2006). The hidden costs of Control. *The American Economic Review*, 96(5), 1611-1630.

Fang, M., & Gerhart, B. (2012). Does pay for performance diminish intrinsic interest? *The International Journal of Human Resource Management*, 23(6), 1176-1196.

Franco-Santos, M., & Bourne, M. (2005). An examination of the literature relating to issues affecting how companies manage through measures. *Production, Planning & Control*, 16(2), 114-124.

Franco-Santos, M., Lucianetti, L., & Bourne, M. (2012). Contemporary performance measurement systems: A review of their consequences and a framework for research. *Management accounting research*, 23(2), 79-119.

Gagne, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior*, 26(4), 331-362.

Gagné, M., & Forest, J. (2008). The study of compensation systems through the lens of self-determination theory: Reconciling 35 years of debate. *Canadian Psychology*, 49(3), 225-232.

Gagne, M., Forest, J., Gilbert, M. H., Aube, C., Morin, E., & Malorni, A. (2010). The Motivation at Work Scale: Validation Evidence in Two Languages. *Educational and Psychological Measurement*, 70(4), 628-646.

Gagné, M., Forest, J., Vansteenkiste, M., Crevier-Braud, L., Broeck, A. V. d., Aspeli, A. K., . . . Westbye, C. (2014). The Multidimensional Work Motivation Scale: Validation evidence in seven languages and nine countries. *European Journal of Work and Organizational Psychology*, 1-19.

Gillet, N., Gillet, P., Colombat, E., Michinov, A.-M., Pronost, E., & Fouquereau. (2013). Procedural justice, supervisor autonomy support, work satisfaction, organizational identification and job performance: the mediating role of need satisfaction and perceived organizational support. *Journal of advanced nursing*, 69(11), 2560.

Gneezy, U., & Rustichini, A. (2000). Pay enough or don't pay at all. *Quarterly Journal of Economics*, 115(3), 791-810.

Goffin, R. D., & Gellatly, I. R. (2001). A multi-rater assessment of organizational commitment: Are self-report measures biased? *Journal of Organizational Behavior*, 10(22), 437-451.

Hartmann, F., & Slapnicar, S. (2009). How formal performance evaluation affects trust between superior and subordinate managers. *Accounting, organizations and society*, 34(6-7), 722-737.

Hartmann, F., & Slapnicar, S. (2012a). Pay fairness and intrinsic motivation: the role of pay transparency. *International Journal of Human Resource Management*, 23(20), 4283-4300.

Hartmann, F., & Slapnicar, S. (2012b). The perceived fairness of performance evaluation: The role of uncertainty. *Management accounting research*, 23(1), 17-33.

Helin, S., Jensen, T., Sandstrom, J., & Clegg, S. (2011). On the dark side of codes: Domination not enlightenment. *Scandinavian Journal of Management*, 27(1), 24-33.

Hempel, P. S., Zhang, Z. X., & Han, Y. L. (2012). Team empowerment and the organizational context: Decentralization and the contrasting effects of formalization. *Journal of Management*, 38(2), 475-501.

Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard - Measures that drive performance. *Harvard Business Review*, 70(1), 71-79.

Kohn, A. (1993). Why Incentive Plans Cannot Work. *Harvard Business Review*, 71(5), 54-63.

Kunz, A. H., & Pfaff, D. (2002). Agency theory, performance evaluation, and the hypothetical construct of intrinsic motivation. *Accounting Organizations and Society*, 27(3), 275-295.

Kunz, J., & Linder, S. (2012). Organizational Control and Work Effort – Another Look at the Interplay of Rewards and Motivation. *European accounting review*, 21(3), 591-621.

Langfred, C. W., & Moye, N. A. (2004). Effects of task autonomy on performance: An extended model considering motivational, informational, and structural mechanisms. *Journal of applied psychology*, 89(6), 934-945.

Li, Y. A., Lee, S. H., Li, X. Y., & Liu, Y. (2010). Knowledge Codification, Exploitation, and Innovation: The Moderating Influence of Organizational Controls in Chinese Firms. *Management and Organization Review*, 6(2), 219-241.

Libby, R., & Lipe, M. G. (1992). Incentives, effort, and the cognitive processes involved in accounting-related judgements. *Journal of Accounting Research*, 30(2), 249-273.

Liu, X., & Leitch, R. (2013). Performance effects of setting targets and pay–performance relations before or after operations. *Management accounting research*, 24(1), 64-79.

MacBryde, J., Paton, S., Bayliss, M., & Grant, N. (2014). Transformation in the defence sector: The critical role of performance measurement. *Management accounting research*, 25(2), 157-172.

Malina, M. A., & Selto, F. H. (2001). Communicating and controlling strategy: an empirical study of the effectiveness of the balanced scorecard. *Journal of Management Accounting Research* 13(47-90.

Mills, M. J. (2011). Associations among achievement measures and their collective prediction of work involvement. *Personality and Individual Differences*, 50(3), 360-364.

Parker, S. K. (2003). Longitudinal effects of lean production on employee outcomes and the mediating role of work characteristics. *Journal of Applied Psychology*, 88(4), 620-634.

Patel, P. (2011). Role of manufacturing flexibility in managing duality of formalization and environmental uncertainty in emerging firms. *Journal of Operations Management*, 29(1-2), 143-162.

Pouliakas, K. (2010). Pay Enough, Don't Pay Too Much or Don't Pay at All? The Impact of Bonus Intensity on Job Satisfaction. *Kyklos*, 63(4), 597-626.

Roth, G., Assor, A., Kanat-Maymon, Y., & Kaplan, H. (2007). Autonomous motivation for teaching: How self-determined teaching may lead to self-determined learning. *Journal of Educational Psychology*, 99(4), 761-774.

Ryan, R. M., & Deci, E. L. (2000a). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, 25(1), 54-67.

Ryan, R. M., & Deci, E. L. (2000b). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *The American psychologist*, 55(1), 68-78.

Rynes, S. L., Gerhart, B., & Parks, L. (2005). Personnel psychology: performance evaluation and pay for performance. *Annual Review of Psychology*, 56(571-600.

Sliwka, D. (2007). Trust as a signal of a social norm and the hidden costs of incentive schemes. *The American Economic Review*, 97(3), 999-1012.

Spector, P. (2006). Method variance in organizational research: Truth or urban legend? *Organizational research methods*, 9(221-232.

Stone, D. N., Bryant, S. M., & Wier, B. (2010). Why are financial incentive effects unreliable? An extension of Self-Determination theory. *Behavioral Research in Accounting*, 22(2), 105-132.

Van den Broeck, A., Lens, W., De Witte, H., & Van Coillie, H. (2013). Unraveling the importance of the quantity and quality of workers' motivation for well-being: A person-centered perspective. *Journal of Vocational Behavior*, 82(69-78.

Van den Broeck, A., Vansteenkiste, M., De Witte, H., Soenens, B., & Lens, W. (2010). Capturing autonomy, competence, and relatedness at work: Construction and initial validation of the Work-related Basic Need Satisfaction scale. *Journal of Occupational and Organizational Psychology*, 83(4), 981.

Van der Hauwaert, E., & Bruggeman, W. (2014). *Title*. working paper.

Van Herpen, M., Van Praag, M., & Cools, K. (2005). The effects of performance measurement and compensation on motivation: an empirical study. *De Economist*, 153(3), 303-329.

Vansteenkiste, M., Lens, W., & Deci, E. L. (2006). Intrinsic versus extrinsic goal contents in self-determination theory: Another look at the quality of academic motivation. *Educational Psychologist*, 41(1), 19-31.

Vansteenkiste, M., Niemiec, C. P., & Soenens, B. (2010). The development of the five mini-theories of self-determination theory: an historical overview, emerging trends, and future directions. In T.C. Urdan, & S.A. Karabenick (Eds.), *The Decade Ahead: Theoretical Perspectives on Motivation and Achievement* (pp. 105-165). UK: Emerald Group Publishing Limited.

Weibel, A., Rost, K., & Osterloh, M. (2007). *Title*. working paper. University of Zurich. Zurich.

Widener, S. K. (2007). An empirical analysis of the levers of control framework. *Accounting, organizations and society*, 32(7-8), 757-788.

Wong-On-Wing, B., Guo, L., & Lui, G. (2010). Intrinsic and Extrinsic Motivation and Participation in Budgeting: Antecedents and Consequences. *Behavioral Research in Accounting*, 22(2), 133-153.

Wouters, M. (2009). A developmental approach to performance measures - Results from a longitudinal case study. *European Management Journal*, 27(1), 64-78.

Wouters, M., & Roijmans, D. (2011). Using prototypes to induce experimentation and knowledge integration in the development of enabling accounting information. *Contemporary Accounting Research*, 28(2), 708-736.

Wouters, M., & Wilderom, C. (2008). Developing performance-measurement systems as enabling formalization: A longitudinal field study of a logistics department. *Accounting, Organizations and Society*, 33(4-5), 488-516.

TABLES

Table 1: Demographiques (company size, gender, age and management level)

PANEL A	N	Freq	%	Cumul %	Mean	Med	Min	Max	SD
Company size	314								
51 to 100		2	.6	.6					
101 to 250		82	26.1	26.8					
251 to 500		53	16.9	43.6					
501 to 1,000		42	13.4	57.0					
1,001 to 2,000		25	8.0	65.0					
2,001 to 5,000		26	8.3	73.2					
5,001 to 10,000		17	5.4	78.7					
> 10,001		67	21.3	100.0					
Gender	314								
Male		248	79.0	79.0					
Female		66	21.0	100.0					
Age	313				47.81	48	29	65	7.67
Management level	314								
Middle manager		172	54.8	54.8					
Top manager		142	45.2	100.0					

PANEL B	N	Freq	Per-	Cumul	Mean	Med	Min	Max	SD
Company size	189								
51 to 100		0	.0	.0					
101 to 250		43	22.8	22.8					
251 to 500		29	15.3	38.1					
501 to 1,000		24	12.7	50.8					
1,001 to 2,000		17	9.0	59.8					
2,001 to 5,000		15	7.9	67.7					
5,001 to 10,000		11	5.8	73.5					
> 10,001		50	26.5	100.0					
Gender	189								
Male		145	76.70	76.70					
Female		44	23.30	100.0					
Age	188				47.92	48	29	65	7.84
Management level	189								
Middle manager		103	54.5	54.5					
Top manager		86	45.5	100.0					

Individual bonus (Y/N)	189								
No		74	39.2	39.2					
Yes		115	60.8	100.0					

PANEL C	N	Freq	Per-	Cumul	Mean	Med	Min	Max	SD
Company size	115								
51 to 100		0	.0	.0					
101 to 250		23	20.0	20.0					
251 to 500		13	11.3	31.3					
501 to 1,000		13	11.3	42.6					
1,001 to 2,000		12	10.4	53.0					
2,001 to 5,000		8	7.0	60.0					
5,001 to 10,000		7	6.1	66.1					
> 10,001		39	33.9	100.0					
Gender	115								
Male		93	80.9	80.9					
Female		22	19.1	100.00					
Age	114				48.21	48	29	65	7.92
Management level	115								
Middle manager		56	48.7	48.7					
Top manager		59	51.3	100.0					
Magnitude bonus (3 groups)	115								
Small		35	30.4	30.4					
Medium		40	34.8	65.2					
High		40	34.8	100.0					

Table 2: Demographiques (industry)

	PANEL A (N=313)			PANEL B (N=189)			PANEL C (N=115)		
	Freq	**%**	**Cum. %**	**Freq**	**%**	**Cum. %**	**Freq**	**%**	**Cum. %**
Agriculture	3	1.0	1.0	1	0.5	0.5	1	0.9	0.9
Food	36	11.5	12.5	23	12.2	12.7	16	13.9	14.8
Textile	5	1.6	14.1	1	0.5	13.2	1	0.9	15.7
Chemical products, perfum, jewelerie	44	14.1	28.1	29	15.3	28.6	20	17.4	33.0
Metal, machine construction	42	13.4	41.5	26	13.8	42.3	14	12.2	45.2
Construction of carriages, furniture, utilities, toys, sports goods	39	12.5	54.0	28	14.8	57.1	16	13.9	59.1
Construction, wood, glass	40	12.8	66.8	20	10.6	67.7	10	8.7	67.8
Retail and wholesale trade	30	9.6	76.4	15	7.9	75.7	6	5.2	73.0
Transport	16	5.1	81.5	10	5.3	81.0	6	5.2	78.3
Shipping	2	0.6	82.1	1	0.5	81.5	1	0.9	79.1
Hotel and catering industry	1	0.3	82.4	1	0.5	82.0	1	0.9	80.0
Media (film, television, radio)	10	3.2	85.6	5	2.6	84.7	3	2.6	82.6
Factoring, holdings	13	4.2	89.8	11	5.8	90.5	8	7.0	89.6
Tourism	5	1.6	91.4	1	0.5	91.0	1	0.9	90.4
Rental services	6	1.9	93.3	2	1.1	92.1	1	0.9	91.3
Defense, education, health and care sector	5	1.6	94.9	4	2.1	94.2	3	2.6	93.9
Repair and amusement sector	10	3.2	98.1	6	3.2	97.4	5	4.3	98.3
Other	6	1.9	100.0	5	2.6	100.0	2	1.7	100.0

Table 3: Factor loadings and Cronbach's alpha (N = 314)

		Item	Cronbach's alpha	Factor Loading
Enabling PMS			.902	
	Repair 1	The performance measures help me to start actions for improvement myself.		.769
	Repair 2	The performance measurement system makes it possible to react in time, consequently be able to avoid problems.		.695
	Repair 3	The performance measurement system makes it possible to put forward some measures which can serve as alarm bells.		.603
	Inttra 1	I understand the performance measures in my domain.		.582
	Inttra 2	I understand why certain performance measures are included in my domain.		.722
	Inttra 3	There is information available about the current condition of the performance measures in my domain.		.773
	Glotra 1	The performance measurement system gives me an indication in how I execute my job.		.687
	Glotra 2	The link between my own tasks and the goals of the organization are clear.		.688
	Glotra 3	The performance measurement systems makes it possible to communicate with the stakeholders of the organization.		.642
	Flex 1	I can take decisions on the basis of the performance information delivered by the performance measurement system.		.672
	Flex 2	Performance measures can be added to the performance measurement system to meet specific work needs.		.629
	Flex 3	Suggestions on which I can make decisions, arise from the performance measurement system.		.688
Fairness			.901	
	Fairness 1	I have full confidence in the system's fairness in determining the goals that need to be reached.		.906
	Fairness 2	I have full confidence in the system's fairness in determining the individual reward.		.927
	Fairness 3	I believe that the way in which my performance is measured is fair.		.815
Autonomous motivation			.764	
	Autmot 1	I work because what I do in this job has a lot of personal meaning to me.		.804
	Autmot 2	I work because I personally consider it important to put efforts in my job.		.426
	Autmot 3	I work because this job represents well who I am deep down.		.704
	Autmot 4	I work because I enjoy this work very much.		.800
	Autmot 5	I work because this job fits well with the interests I have.		.608
	Autmot 6	I work because the work I do is a lot of fun.		.661

Table 4: Dependent and independent variables: mean (M), median (Med), standard deviation (SD)

	N	Autonomous motivation			Enabling PMS			Fairness		
		Mean	Med	St dev	Mean	Med	St dev	Mean	Med	St dev
Panel A										
All respondents	314	5.89	6.00	.628						
No PMS	125	5.77	5.83	.671						
Low enabling PMS	89	5.82	5.83	.626						
High enabling PMS	100	6.03	6.00	.543						
Panel B										
Low + high enabling PMS	189	5.93	6.00	.590	6.00	5.33	.821			
Bonus No	74	5.84	5.83	.653	5.19	5.33	.855			
Bonus Yes	115	5.98	6.00	.541	5.25	5.33	.801			
Panel C										
Bonus Yes	115	5.98	6.00	.541	5.25	5.33	.801	5.31	5.67	1.39

Table 5: Correlations (Pearson) of dependent and independent variables

		1	2	3	4
1. Autonomous motivation	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	314			
2. Enabling performance measurement system	Pearson Correlation	.239**	1		
	Sig. (2-tailed)	.001			
	N	189	189		
3. Fairness	Pearson Correlation	.233**	.204*	1	
	Sig. (2-tailed)	.002	.028		
	N	170	115	170	
4. Magnitude	Pearson Correlation	.016	0.08	.197*	1
	Sig. (2-tailed)	.840	.393	.010	
	N	170	115	170	170

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 6: ANCOVA effect of PMS on autonomous motivation (N=314)

	Sum of Squares	**F-statistic**	**P-value**	
Management level (middle vs. top)	1.433	3.760	.053	
Enabling PMS (3 groups)	3.720	4.504	.008	
Post hoc tests	**Mean**			
No PMS	5.77	vs. low enabling PMS		.525[b]
		vs. high enabling PMS		.003[b]
Minimally enabling PMS	5.83	vs. no PMS		.525[b]
		vs. high enabling PMS		.029[b]
Highly enabling PMS	6.03	vs. no PMS		.003[b]
		vs. low enabling PMS		.029[b]

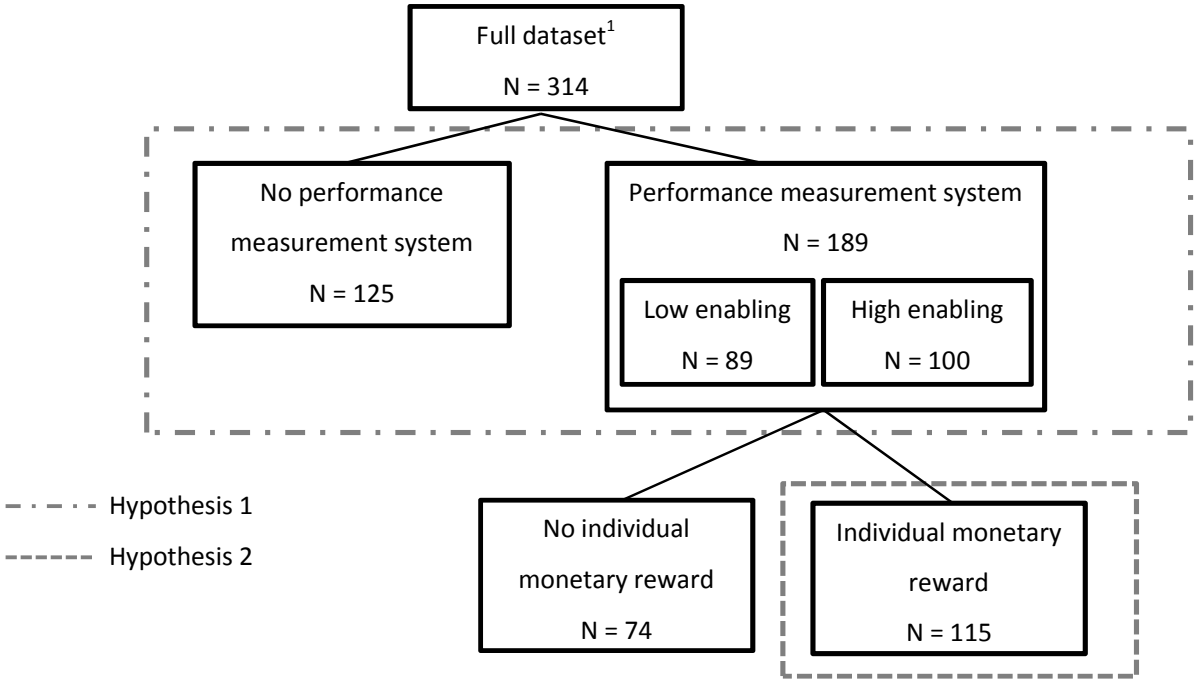
[b] Adjustment for multiple comparisons: Least Significant Difference

Table 7: Hierarchical regression effect fairness individual bonus and enabling PMS on autonomous motivation (N=115)

	Reduced model			Full model		
Variables	**Coefficient**	**t-statistics**	**p-value**	**Coefficient**	**t-statistics**	**p-value**
Management level (middle vs. Top)	.132	1.348	.180	.094	.923	.358
Enabling PMS	.170	2.763	.007	.781	2.383	.019
Fairness				.746	2.246	.027
Magnitude				.080	.976	.331
Enabling PMS x Fairness				-.127	-1.989	.049
Enabling PMS x Magnitude				-.018	-1.008	.316
Fairness x Magnitude				-.014	-1.011	.315
Enabling PMS x Fairness x Magnitude				.003	1.04	.301
F-value	4.837		.010	2.585		.013
Adjusted R^2	.063			.100		
N	115			115		

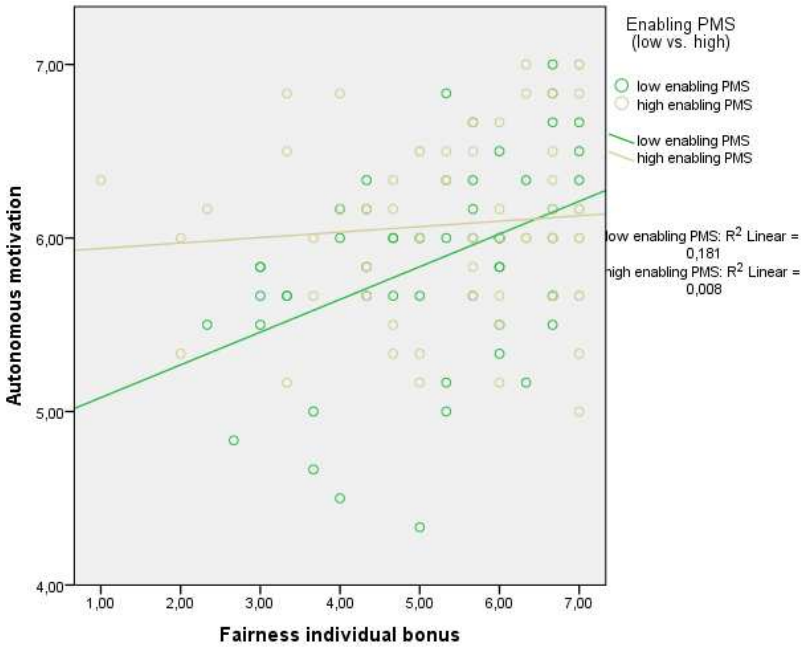
FIGURES

Figure 1: Graphical illustration dataset



[1] After deleting outliers and first level managers

Figure 2: Effect of fairness and enabling performance measurement system on autonomous motivation



CHAPTER 5 – CONCLUSIONS

The goal of this dissertation was to test how an enabling performance measurement system (PMS) affects managerial behaviour and the underlying drivers and mechanisms explaining this relationship. More specifically, a search was conducted for the drivers determining whether the PMS was perceived as enabling, along with a companion search for the underlying mechanisms explaining the level of managerial performance in a context where an enabling PMS was used. Therefore, the research approach of this dissertation consisted of two parts. The first part was the first study to investigate the possibility of a PMS to be enabling. The research question was "Under which *conditions* is a PMS perceived as enabling?" Examining the *effect of an enabling PMS* on managerial behaviour is the second part where the second study answered the questions of "Whether an enabling PMS can affect managerial performance?" and "Whether there are mediating variables that need to be taken into consideration?" The third study elaborated on the findings of the second study, and investigated the power of individual monetary rewards when the organization has an enabling PMS.

This last chapter summarizes the main conclusions of the dissertation. The findings of the three studies are brought together to provide a general overview of the effect of an enabling PMS on managerial behavior. Furthermore, the contextual and methodological limitations are discussed and opportunities for future research are highlighted. This chapter ends with an elaboration on the theoretical contributions and the implications for practice.

1. MAIN FINDINGS

1.1 CONDITIONS TO BE AN ENABLING PMS

This research revealed that a PMS can be enabling. Consequently, it adds to findings of previous literature that discussed the development and use of enabling PMSs (Ahrens & Chapman, 2004; Wouters & Wilderom, 2008). There are four features underlying an enabling PMS: repair, internal transparency, global transparency and flexibility. However, a PMS that has these four features will not automatically be an enabling PMS. The willingness of the organization to develop an enabling PMS by having the four features is not sufficient to create a PMS that is perceived as enabling.

This study detected that the perception of the manager toward the PMS plays a pivotal role. If organizations provide the possibility to participate during the development and implementation of the PMS, managers must experience true participation. This means that managers are offered

opportunities to actively think and cooperate in the development process of the PMS. Only when managers have true participation they will perceive the PMS as enabling. When managers experience pseudo participation, meaning that they are promised participation in the process but feel their opinions and suggestions are not taken into consideration, they often do not perceive the PMS as enabling. Notably, when the manager does not feel the need to participate, not providing the opportunity to participate will have no influence on the perception of the PMS as enabling. This implies there is no relationship between the perception of the PMS as enabling and the manager's opportunity to participate in the development process if the manager had no participatory aspirations.

1.2. Effect of an enabling PMS on managerial performance and motivation

The findings of the second study and third study indicated that the degree to which the PMS is perceived as enabling is important. The results indicated that the higher the degree to which the PMS is perceived as enabling, the higher the level of managerial performance. The relationship between an enabling PMS and managerial performance is mediated by the manager's level of autonomous motivation. There is a positive association between an enabling PMS and autonomous motivation, and autonomous motivation and managerial performance. These positive results gave rise to the question whether rewards can add to the level of autonomous motivation.

The debate on the power of monetary rewards has been going on for decades. The findings of scholars indicating the pivotal role of rewards to create strategic alignment and enhance organizational performance (Kunz & Pfaff, 2002) contrasted sharply with the discovery of the hidden cost of rewards (Falk & Kosfeld, 2006; Kohn, 1993). More recently, the views on the topic of rewards are more nuanced. Scholars have pointed out that the partial settings might be the basis for the equivocal findings on this topic (Ferreira & Otley, 2009). Studies to fill this research gap continue, but the performance-reward issue is far from being resolved. Prior literature stressed the relevance of motivation in the search for the effectiveness of monetary rewards (Bonner & Sprinkle, 2002; Decoene & Bruggeman, 2006).

The third study followed this line of research and investigated the impact of monetary rewards on autonomous motivation. It added to prior research (Decoene & Bruggeman, 2006; Franco-Santos, Lucianetti, & Bourne, 2012; Malina & Selto, 2001) as it found evidence that the PMS can have negative effects on motivation. When the PMS is perceived as being minimally enabling, an individual monetary reward that has a low level of fairness is associated with a low level of autonomous motivation. The higher the perceived fairness of the individual monetary reward, the higher the level

of autonomous motivation. This indicates that there exists a detrimental effect of monetary rewards on motivation if this reward is perceived as unfair. The third study showed more nuanced findings of the effect of rewards when the PMS was perceived as highly enabling. In this situation, the fairness of the individual monetary reward will not influence the level of autonomous motivation. As a result, these findings further indicate the pivotal role of enabling. The degree to which a PMS is enabling must be taken into account when research on individual monetary rewards is conducted.

Notable but not surprising is that controlled motivation was not influenced either positively or negatively by the degree to which the PMS was perceived as enabling. An enabling PMS that has the four features (repair, internal transparency, global transparency, and flexibility) supported the manager's need for autonomy, competence and relatedness. This support of these three basic psychological needs led to internalization of the controlled motivation and enhanced the level of autonomous motivation. Consequently, a rise in autonomous motivation is more likely than an increase of controlled motivation. Remarkable, but not the core of this research was that the findings in the second study indicated that controlled motivation was unrelated (or might even be negatively related) to managerial performance. This is in contrast with prior research which indicates that controlled motivation creates high involvement in an activity (Vansteenkiste et al., 2010). Nevertheless, too little variables were taken into consideration to preclude the existence of confounding factors that might be at work in this relationship. Further research to unravel this relationship is necessary, which was beyond the scope of this dissertation. Some other avenues for future research and the limitations of this dissertation are noteworthy and are discussed next.

2. LIMITATIONS

This dissertation had some methodological and contextual limitations. First, this research was set up in real life situations. Although this offered the opportunity to do research without having to create hypothetical situations that would be perceived as valid when filled out by managers, the disadvantage of this method is that it was hard to control for all factors that might influence the dependent variable. To meet this shortcoming, consequently rule out confounding variables, control variables often cited in the literature as potential factors to influence the relationship were integrated in the analyses.

Second, studies 2 and 3 used self-reported measures to measure the degree to which the PMS was perceived as enabling, the degree of perceived fairness concerning the individual monetary rewards, motivation, effort and managerial performance. To capture the managerial performance and effort, a

more objective measure should have been in place. Nevertheless, as a large sample of managers from a wide range of organizations was wanted, it was impossible to get indication on the organizational performance or the managers' performance by also questioning the manager's direct supervisor. The promise for anonymity did not allow for getting this information. Moreover, it was believed that if the respondents knew that supervisors would also give indications on their levels of effort and performance, they would have been less willing to participate in the survey and answer honestly to the posed questions and statements. In addition, previous research indicated that managers are the best judges of their own performance (Hall, 2011; Mills, 2011). Although an enabling PMS and fairness of the individual monetary reward were self-reported measures, this is not considered a shortcoming but a strength of this research. The first study gave indications that although organizations set up the development and use of a PMS to be enabling, it can be perceived by the organization's managers as not very enabling. Consequently, it was very important to measure the perception of the manager on the degree to which they perceived the system as enabling rather than how the system is set up to be enabling. The same reasoning should be used by evaluating the degree of fairness of the individual monetary reward.

Third, getting more insights into the conditions that determine whether the PMS will be perceived as enabling called for in-depth research through interviews. Therefore, the first study made use of case study research in which there was control for multiple variables while digging into the possible underlying factors by conducting semi-structured interviews. However, using this method made generalizations difficult. As a result, the results should be interpreted with care.

3. FUTURE RESEARCH

The major opportunity for future research is related to the motivation. Although the self-determination theory (SDT) distinguishes two major categories of motivation, this dissertation mainly focuses on autonomous motivation. The reason for this focus came from the literature which indicated that the autonomous motivation is more powerful than the controlled motivation (Vansteenkiste, Niemiec, & Soenens, 2010; Wong-On-Wing, Guo, & Lui, 2010). Although previous literature indicated that the controlled motivation also resulted in high involvement in an activity (Vansteenkiste et al., 2010), preliminary research in this dissertation on controlled motivation discovered no significant relation or even a slightly negative relation between controlled motivation and managerial performance. Consequently, further research to investigate whether there might be confounding variables influencing these relationships is necessary. Three different roads can be followed to search for underlying drivers to resolve the equivocal findings.

The first road deals with the overall importance of controlled motivation in middle and top management functions. The studies in this dissertation indicated that middle and top managers have a high level of autonomous motivation. A recent study by Van den Broeck et al. (2013) indicates that when autonomous motivation is already high, controlled motivation is less likely to have an effect on managerial outcomes (Van den Broeck, Lens, De Witte, & Van Coillie, 2013). This may have caused the small significance of the controlled motivation in the studies. Nevertheless, the studies in this dissertation have too little data to confirm this line of reasoning. Therefore, a call for research to investigate the motivation profiles for the middle and top management population is in order. A previous study on a representative sample of the Belgian work force revealed that four different motivational profiles exist (Van den Broeck et al., 2013). Group one has a high level of autonomous motivation combined with a high level of controlled motivation, group two has a high level of autonomous motivation and a low level of controlled motivation, group three has a low level of autonomous motivation combined with a high level of controlled motivation, and group four has a low level of autonomous motivation combined with a low level of controlled motivation. The results of the studies in this dissertation indicated that the groups with a low level of autonomous motivation might be non-existent for middle and top management profiles. The search for the motivation profiles should be combined with research on the role of the managers' superiors to influence their motivation profile. Previous research indicated that the subordinates of superiors that have an autonomy supportive managerial style show more autonomous motivation (Hardré & Reeve, 2009). It would be interesting to investigate whether this finding also holds for middle and top managers, as this might influence the motivation profiles.

Second, this dissertation did not focus on the effect of rewards on the controlled motivation, because the autonomous motivation was revealed most influential to affect performance. Although controlled motivation has been associated with inconsistent goal striving, impaired performance and persistence (Gagné & Forest, 2008), it can result in high involvement in an activity (Vansteenkiste et al., 2010). In addition, the use of extrinsic rewards can induce controlled motivation (Gagne & Deci, 2005) in some situations. The integration of the relationship between rewards and controlled motivation with the information on motivation profiles of top and middle managers can improve the knowledge on the effect of monetary rewards on managerial behaviour.

The third road for future research is not related to the level of controlled motivation, however will further investigate the autonomous motivation. In this dissertation the contribution of the individual monetary rewards in a PMS context on the level of autonomous motivation is investigated. Nevertheless, group rewards might also have a significant impact on the autonomous motivation.

This is due to the power of group rewards to enhance the feeling of relatedness, which will augment autonomous motivation (Ryan & Deci, 2000). Therefore, a study that investigates the effect of group rewards on the autonomous motivation is necessary. As this dissertation already revealed that many middle and top managers have a high degree of autonomous motivation, action research will be the most appropriate technique for the proposed research avenue. More specifically, an experimental study in one or several organizations in which group rewards are introduced for part of the organization should be conducted. A pre-test and post-test that measure the autonomous motivation should give more insights into how implementing group rewards alters the level of autonomous motivation.

Despite the possible pitfalls of this research and the potential roads for future research, this dissertation contributes to both literature and practice. The contributions are described in the next section.

4. ACADEMIC CONTRIBUTIONS

This dissertation contributes to the literature in three ways. First, it adds to the existing literature by answering the call to further investigate the conditions under which a developmental PMS approach is effective (Wouters, 2009). This research stresses the importance of true participation during the development process. Moreover, it warns of the difference between the degree to which the PMS is developed to be enabling and the degree to which the PMS is perceived as enabling. This research also responds to the call to investigate the linkages between business PMSs and reward practices (Franco-Santos & Bourne, 2005). Moreover, this research also lifts a corner of the veil on the power of rewards. It adds to the ongoing discussion of the possible detrimental effects of individual monetary rewards on autonomous motivation. It did find a detrimental effect of individual monetary rewards on autonomous motivation; however the findings were more nuanced than previously found (e.g.; Falk & Kosfeld, 2006; Kohn, 1993; Sliwka, 2007). The third study pointed out that the degree to which the PMS is perceived as enabling will determine the motivational power of rewards. When the PMS is perceived as highly enabling, the manager's level of autonomous motivation will be higher. When the PMS is perceived minimally enabling, the detrimental effect of monetary rewards exists when the bonus is perceived as not fair. On the contrary, when the manager perceives the PMS as highly enabling, the use of a fair individual monetary reward does not add much to the manager's level of autonomous motivation.

Second, an operationalization of the concept enabling PMS was executed. Previous literature in a management control context investigated the concept of enabling formalization in an exploratory context using longitudinal studies or interviews (e.g.; Ahrens & Chapman, 2004; Cools, Emmanuel, & Jorissen, 2008; Free, 2007; Wouters & Wilderom, 2008). However, both literature and practice could benefit from more quantitative research to further investigate the concept of an enabling PMS. Therefore, survey research or experimental research was necessary. A scale to measure enabling PMS is needed to conduct survey research. The development of a scale was addressed by only a few studies, focusing only on a part of the management control systems (budget and work teams) (Chapman & Kihn, 2009; González-Romá, Fortes Ferreira, & Peiró, 2009; Hartmann & Maas, 2011). This research contributed to the literature by developing a scale that measures the degree to which a PMS is perceived as enabling.

Third, this research delivered additional evidence that strengthens that the autonomous motivation is more powerful than the controlled motivation. The second study indicated a more powerful relationship between autonomous motivation and managerial performance, than between controlled motivation and managerial performance, which seems to be statistically insignificant (or might even be marginally negatively significant). Consequently, the results of this research add to previous findings indicating that autonomous motivation is more powerful to increase performance (Baard, Deci, & Ryan, 2004; Vansteenkiste et al., 2010; Wong-On-Wing et al., 2010) than controlled motivation.

5. PRACTICAL IMPLICATIONS

Besides the implications for the literature, this dissertation also has practical implications. Within the context of PMSs, both success stories as well as failures have been raised in practice. Therefore, more information about the drivers and mechanisms is required. This research gave evidence about the differences in behavioral outcomes of managers dependent upon how the PMS is used.
First, when an organization plans to develop and use a PMS, the findings of this research point toward the importance of creating an enabling PMS. The higher perception of the PMS as being enabling, the higher the level of autonomous motivation and subsequently managerial performance. Consequently, the organization can make from the implementation of its PMS a success story by creating a PMS that is perceived as highly enabling.

Second, to enhance the possibility of the PMS to be perceived as highly enabling, the organization benefits from taken into consideration the participation when the PMS is developed. When

managers do not feel the need to participate in the development process, not letting them participate does not influence their perception on the PMS as enabling. Therefore it is not necessary to let managers participate in the development process to get a PMS that is perceived as enabling. However, when participation is offered to middle managers, these managers should have true participation in order to perceive the PMS as enabling. When managers are offered participation, but they feel that nothing is done with their remarks and recommendations, the PMS will not be perceived as enabling. As only about 60 percent of the companies in Belgium use a PMS, this is relevant information for the other 40 percent if they plan to introduce a PMS. Making sure that the PMS has all the necessary features to be enabling is not enough by itself to create an enabling PMS.

The third contribution this research makes to practice is the indications for the use of individual monetary rewards when a PMS is in use. Both the necessity of monetary rewards to create performance and the detrimental effect of monetary rewards on managerial behavior have been proven. This led to organizations being clueless of whether it is interesting to implement monetary rewards in the organization and if so, when and how these rewards should be used. The results of this research indicate that organizations should look at their PMS and the manager's perception on the PMS when considering monetary rewards. When the PMS is perceived as highly enabling, monetary rewards cannot contribute to further enhance autonomous motivation. When on the contrary the PMS is perceived as minimally enabling, organizations can benefit from using individual monetary rewards if the bonus has a high level of perceived fairness. When the perceived fairness on the monetary reward is low, this will result in a low level of autonomous motivation.

6. REFERENCES

Ahrens, T., & Chapman, C. S. (2004). Accounting for flexibility and efficiency: A field study of management control systems in a restaurant chain. *Contemporary Accounting Research*, 21(2), 271-301.

Baard, P. P., Deci, E. L., & Ryan, R. M. (2004). Intrinsic need satisfaction: A motivational basis of performance and well-being in two work settings. *Journal of Applied Social Psychology*, 34(10), 2045-2068.

Bonner, S. E., & Sprinkle, G. B. (2002). The effects of monetary incentives on effort and task performance: theories, evidence, and a framework for research. *Accounting Organizations and Society*, 27(4-5), 303-345.

Chapman, C. S., & Kihn, L. A. (2009). Information system integration, enabling control and performance. *Accounting, Organizations and Society*, 34(2), 151-169.

Cools, M., Emmanuel, C., & Jorissen, A. (2008). Management control in the transfer pricing tax compliant multinational enterprise. *Accounting, Organizations and Society*, 33(6), 603-628.

Decoene, V., & Bruggeman, W. (2006). Strategic alignment and middle-level managers' motivation in a balanced scorecard setting. *International Journal of Operations & Production Management*, 26(3-4), 429-448.

Falk, A., & Kosfeld, M. (2006). The hidden costs of Control. *The American Economic Review*, 96(5), 1611-1630.

Ferreira, A., & Otley, D. (2009). The design and use of performance management systems: An extended framework for analysis. *Management accounting research*, 20(4), 263-282.

Franco-Santos, M., & Bourne, M. (2005). An examination of the literature relating to issues affecting how companies manage through measures. *Production, Planning & Control*, 16(2), 114-124.

Franco-Santos, M., Lucianetti, L., & Bourne, M. (2012). Contemporary performance measurement systems: A review of their consequences and a framework for research. *Management accounting research*, 23(2), 79-119.

Free, C. (2007). Supply-chain accounting practices in the UK retail sector: Enabling or coercing collaboration? *Contemporary Accounting Research*, 24(3), 897-933.

Gagne, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior*, 26(4), 331-362.

Gagné, M., & Forest, J. (2008). The study of compensation systems through the lens of self-determination theory: Reconciling 35 years of debate. *Canadian Psychology*, 49(3), 225-232.

González-Romá, V., Fortes Ferreira, L., & Peiró, J. (2009). Team climate, climate strength and team performance. A longitudinal study. *Journal of Occupational and Organizational Psychology*, 82(3), 511-536.

Hall, M. (2011). Do comprehensive performance measurement systems help or hinder managers' mental model development? *Management accounting research*, 22(2), 68-83.

Hardré, P., & Reeve, J. (2009). Training corporate managers to adopt a more autonomy-supportive motivating style toward employees: an intervention study. *International Journal of Training and Development*, 13(3), 165-184.

Hartmann, F. G. H., & Maas, V. S. (2011). The effects of uncertainty on the roles of controllers and budgets: An exploratory study. *Accounting and Business Research*, 41(5), 439-458.

Kohn, A. (1993). Why Incentive Plans Cannot Work. *Harvard Business Review*, 71(5), 54-63.

Kunz, A. H., & Pfaff, D. (2002). Agency theory, performance evaluation, and the hypothetical construct of intrinsic motivation. *Accounting Organizations and Society*, 27(3), 275-295.

Malina, M. A., & Selto, F. H. (2001). Communicating and controlling strategy: an empirical study of the effectiveness of the balanced scorecard. *Journal of Management Accounting Research* 13(47-90.

Mills, M. J. (2011). Associations among achievement measures and their collective prediction of work involvement. *Personality and Individual Differences*, 50(3), 360-364.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *The American psychologist*, 55(1), 68-78.

Sliwka, D. (2007). Trust as a signal of a social norm and the hidden costs of incentive schemes. *The American Economic Review*, 97(3), 999-1012.

Van den Broeck, A., Lens, W., De Witte, H., & Van Coillie, H. (2013). Unraveling the importance of the quantity and quality of workers' motivation for well-being: A person-centered perspective. *Journal of Vocational Behavior*, 82(69-78.

Vansteenkiste, M., Niemiec, C. P., & Soenens, B. (2010). The development of the five mini-theories of self-determination theory: an historical overview, emerging trends, and future directions. In T.C. Urdan, & S.A. Karabenick (Eds.), *The Decade Ahead: Theoretical Perspectives on Motivation and Achievement* (pp. 105-165). UK: Emerald Group Publishing Limited.

Wong-On-Wing, B., Guo, L., & Lui, G. (2010). Intrinsic and Extrinsic Motivation and Participation in Budgeting: Antecedents and Consequences. *Behavioral Research in Accounting*, 22(2), 133-153.

Wouters, M. (2009). A developmental approach to performance measures - Results from a longitudinal case study. *European Management Journal*, 27(1), 64-78.

Wouters, M., & Wilderom, C. (2008). Developing performance-measurement systems as enabling formalization: A longitudinal field study of a logistics department. *Accounting, Organizations and Society*, 33(4-5), 488-516.